City of Atlanta General Employees' Pension Fund

Actuarial Valuation and Review

As of July 1, 2019

Segal

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June 25, 2020

Board Members
City of Atlanta General Employees' Pension Fund
Atlanta, Georgia

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of July 1, 2019. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for the fiscal year ending June 30, 2021.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Pension Fund. The census information on which our calculations were based was prepared by Zenith American Solutions and the financial information was provided by KPMG. That assistance is gratefully acknowledged.

The actuarial calculations were directed under the supervision of Jeanette R. Cooper, FSA, FCA, MAAA, Enrolled Actuary. Ms. Cooper is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of her knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in her opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Fund.

We hereby certify that the City of Atlanta General Employees' Pension Fund for the General Employees of the City has been funded in conformity with the minimum funding standards specified in Code Section 47-20-10 of the Official Code of Georgia Annotated known as the Public Pension Funds Standards Law. This certification covers the 2019 fiscal year of the Fund.

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

Sincerely,
Segal

Leon F. (Rocky) Joyner, Jr., ASA, FCA, MAAA, EA
Senior Vice President and National Public Sector Retirement Practice Leader

Jeanette R. Cooper, FSA, FCA, MAAA, EA
Vice President and Consulting Actuary

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Actuarial Valuation Summary

Purpose and basis

This report was prepared by Segal to present a valuation of the City of Atlanta General Employees' Pension Fund as of July 1, 2019. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of Fund assets to cover the estimated cost of settling the Fund's benefit obligations. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Fund, as administered by the Board;
- The characteristics of covered active participants, inactive participants, and retired participants and beneficiaries as of June 30, 2019, provided by Zenith American Solutions;
- The assets of the Fund as of June 30, 2019, provided by KPMG;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The funding policy adopted by the City.

Certain disclosure information required by GASB Statements No. 67 and 68 as of June 30, 2020 and June 30, 2019 for the Fund was provided in separate reports.

Significant issues

1. The July 1, 2019 valuation is used to determine the recommended contribution for the fiscal year period July 1, 2020 to June 30, 2021 (FY'21). The recommended contribution is adjusted for interest to the middle of the fiscal period and satisfies the minimum funding standards under Georgia law Code Section 47-20-10.
2. The plan receives employee contributions of 12% or 13% of base salary (8% for employees hired after October 31, 2011). The City contributes the recommended contribution amount which is net of employee contributions. The recommended contribution amount is composed of the employer normal cost including administrative expenses and a payment to amortize the Unfunded Actuarial Accrued Liability (UAAL) over 21 years. The recommended contribution is actuarially determined as a level percentage of payroll and will increase 3.00% annually if all assumptions are met.
3. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the UAAL and the principal balance. The funding policy adopted by the City meets this standard.
4. The City's recommended contribution for FY '21 is $48.8 million, or 25.84% of projected payroll. This amount is an increase of about $0.6 million from the prior valuation's cost and is mainly attributable to the scheduled increase in the amortization of the unfunded liability. See *Section 2: Reconciliation of ADC* for additional details.
5. Actual contributions made during the fiscal year ending June 30, 2019 were $47,220,000, 100% of the actuarially determined contribution. In the prior fiscal year, actual contributions were $51,903,000, 100% of the prior year actuarially determined contribution.
6. The total contributions made during the fiscal year ending June 30, 2019 were sufficient to cover the normal cost plus interest on the UAAL, thereby reducing the UAAL by $16.4 million.
7. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 69.41%, compared to the prior year funded ratio of 68.06%. This ratio is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 70.46%, compared to 69.72% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of Fund assets to cover the estimated cost of settling the Fund's benefit obligation or the need for or the amount of future contributions.
8. The UAAL is $579.0 million, which is a decrease of $16.9 million since the prior valuation.
9. The actuarial gain from investment and other experience is $0.5 million, or 0.03% of actuarial accrued liability.
10. The net experience gain from sources other than investment experience was 0.1% of the actuarial accrued liability. This gain is not significant.

11. The rate of return on the market value of assets was 6.05% for the July 1, 2018 to June 30, 2019 plan year. The return on the actuarial value of assets was 7.09% for the same period due to the recognition of prior years' investment gains and losses. This resulted in an actuarial loss when measured against the assumed rate of return of 7.25%. This actuarial investment loss increased the employer contribution by about $0.1 million. Given the low fixed income interest rate environment, target asset allocation and expectations of future investment returns for various classes, we advise the Board to continue to monitor actual and anticipated investment returns relative to the assumed long-term rate of return on investments of 7.25%.
12. The actuarial value of assets is 98.51% of the market value of assets. The investment experience in the past years has only been partially recognized in the actuarial value of assets. As the deferred net gain is recognized in future years, the cost of the Plan is likely to decrease unless the net gain is offset by future experience. The recognition of the market gains of $19.8 million will also have an impact on the future funded ratio. If the net deferred gains were recognized immediately in the actuarial value of assets, the actuarially determined contribution would decrease from 25.84% to about 25.06% of payroll.
13. There have been no changes in actuarial assumptions or methods since the last valuation.
14. The disclosure information required for compliance with GASB Statement No. 67, *Financial Reporting for Pension Plans* for the fiscal year ended June 30, 2019, was released to the City's Finance Department on October 11, 2019. Information required for compliance with GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, for the fiscal year ended June 30, 2020, based on a June 30, 2019 measurement date was released to the City's Finance Department on May 20, 2020.
15. It is important to note that this actuarial valuation is based on plan assets as of June 20, 2019. Due to the COVID-19 pandemic, market conditions have changed significantly since the valuation date. The Fund's actuarial status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year. While it is impossible to determine how the market will perform over the next several months, and how that will affect the results of next year's valuation, Segal is available to prepare projections of potential outcomes upon request.
16. Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions. We have included a discussion of various risks that may affect the plan in *Section 2*.

Summary of key valuation results

Fiscal Year		2020	2019
Contributions for fiscal year beginning July 1:	• Actuarially determined contribution	$48,763,497	$48,218,811
	• Actuarially determined contribution as a percent of payroll	25.84%	25.52%
Plan Year		**2019**	**2018**
Actuarial accrued liability for plan year beginning July 1:	• Retired participants and beneficiaries	$1,360,458,932	$1,304,996,100
	• Inactive vested participants	15,596,923	8,756,560
	• Active participants	513,673,057	549,612,699
	• Inactive participants due a refund of employee contributions	3,343,990	2,572,169
	• Total	1,893,072,902	1,865,937,528
	• Normal cost including administrative expenses for plan year beginning July 1	24,589,938	24,511,023
Assets for plan year beginning July 1:	• Market value of assets (MVA)	$1,333,862,000	$1,300,987,000
	• Actuarial value of assets (AVA)	1,314,030,198	1,269,985,380
	• Actuarial value of assets as a percentage of market value of assets	98.51%	97.62%
Funded status for plan year beginning July 1:	• Unfunded actuarial accrued liability on market value of assets	$559,210,902	$564,950,528
	• Funded percentage on MVA basis	70.46%	69.72%
	• Unfunded actuarial accrued liability on actuarial value of assets	$579,042,704	$595,952,148
	• Funded percentage on AVA basis	69.41%	68.06%
	• Amortization period on an AVA basis	21 years	22 years
Key assumptions:	• Net investment return	7.25%	7.25%
	• Inflation rate	2.25%	2.25%
	• Payroll increase	3.00%	3.00%
Demographic data for plan year beginning July 1:	• Number of retired participants and beneficiaries	3,991	3,920
	• Number of inactive vested participants and deferred beneficiaries	125	81
	• Number of active participants	3,674	3,830
	• Number of inactive participants due a refund of employee contributions	759	533
	• Covered payroll	$183,222,147	$183,413,652
	• Average payroll	49,870	47,889
	• Projected payroll	$188,718,811	$188,916,062

Important information about actuarial valuations

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

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

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the plan administrator. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by KPMG. The City uses an “actuarial value of assets” that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results that does not mean that the previous assumptions were unreasonable.

Section 1: Actuarial Valuation Summary

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

The actuarial valuation is prepared at the request of the Board. Segal is not responsible for the use or misuse of its report, particularly by any other party.
An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
Actuarial results in this report are not rounded, but that does not imply precision.
If the Board is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.

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

Actuarial Valuation Results

Participant data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive vested participants, retired participants and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B,* and *C*.

Participant Population: 2010 – 2019

Year Ended June 30	Active Participants[1]	Inactive Vested Participants[2]	Retired Participants and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives
2010	3,261	129	3,605	3,734	1.15
2011	3,093	124	3,765	3,889	1.26
2012	3,159	85	3,826	3,911	1.24
2013	3,171	129	3,790	3,919	1.24
2014	3,243	182	3,805	3,987	1.23
2015	3,307	241	3,834	4,075	1.23
2016	3,452	275	3,874	4,149	1.20
2017	3,688	420	3,889	4,309	1.17
2018	3,830	81	3,920	4,001	1.04
2019	3,674	125	3,991	4,116	1.12

[1] Excludes participants receiving Workers' Compensation benefits.

[2] Includes terminated participants due a refund of employee contributions through 2017. Beginning in 2018, excludes terminated participants due a refund of employee contributions.

Active participants

Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 3,674 active participants with an average age of 46.3, average years of service of 10.3 years and average payroll of $49,870. The 3,830 active participants in the prior valuation had an average age of 46.3, average service of 10.4 years and average payroll of $47,889.

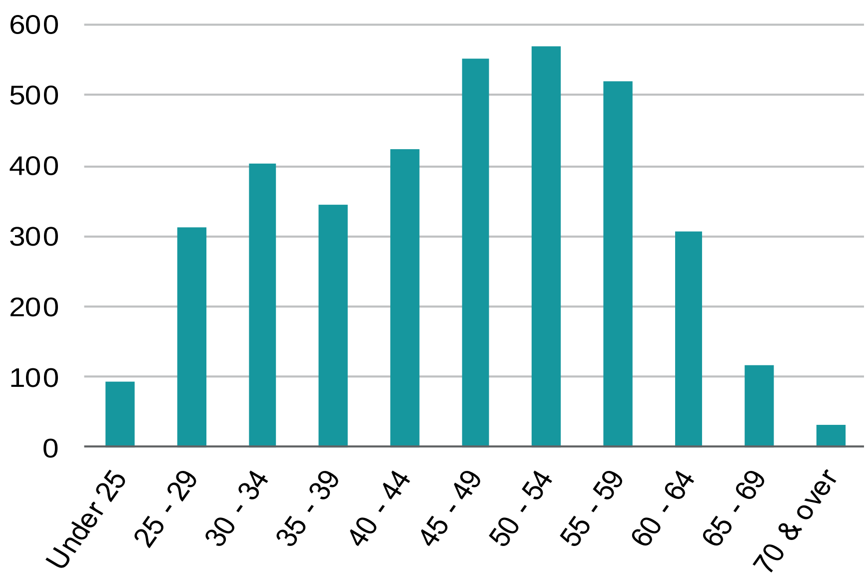
Inactive participants

In this year's valuation, there were 125 participants with a vested right to a deferred or immediate vested benefit.

In addition, there were 759 participants entitled to a return of their employee contributions.

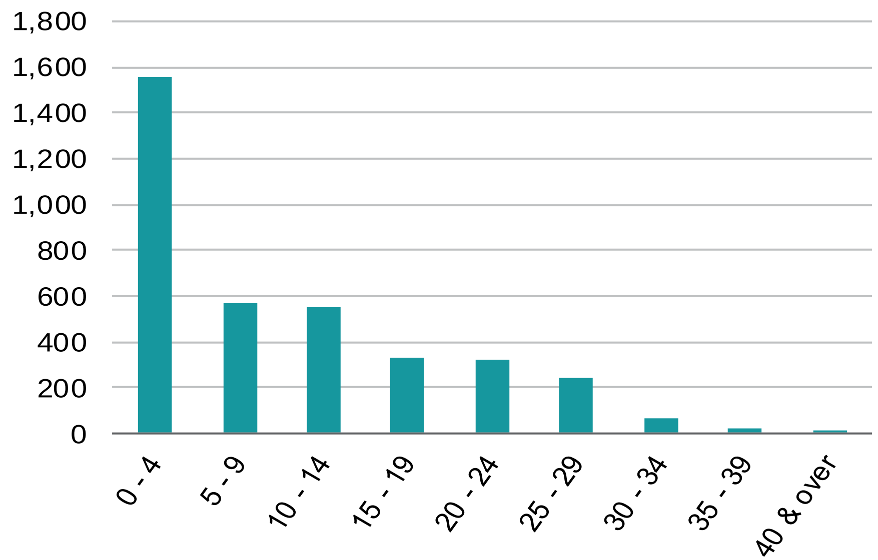
Distribution of Active Participants as of June 30, 2019

Actives by Age



Average age	46.3
Prior year average age	46.3
Difference	0.0

Actives by Years of Service



Average years of service	10.3
Prior year average years of service	10.4
Difference	-0.1

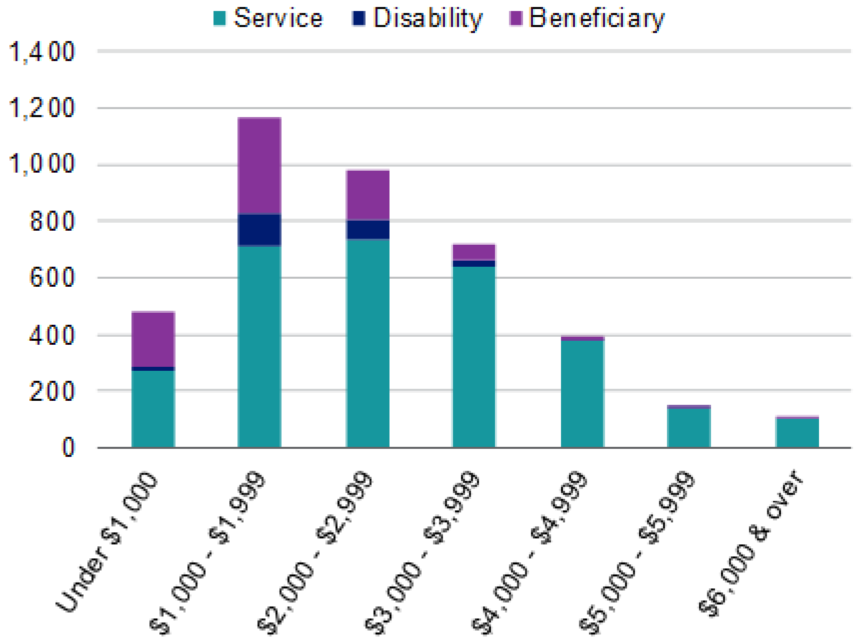
Retired participants and beneficiaries

As of June 30, 2019, 3,203 retired participants and 788 beneficiaries were receiving total monthly benefits of $10,367,683. For comparison, in the previous valuation, there were 3,137 retired participants and 783 beneficiaries receiving monthly benefits of $9,896,724. There were ten retired participants in suspended status this year compared to eight retired participants in suspended status in the prior valuation.

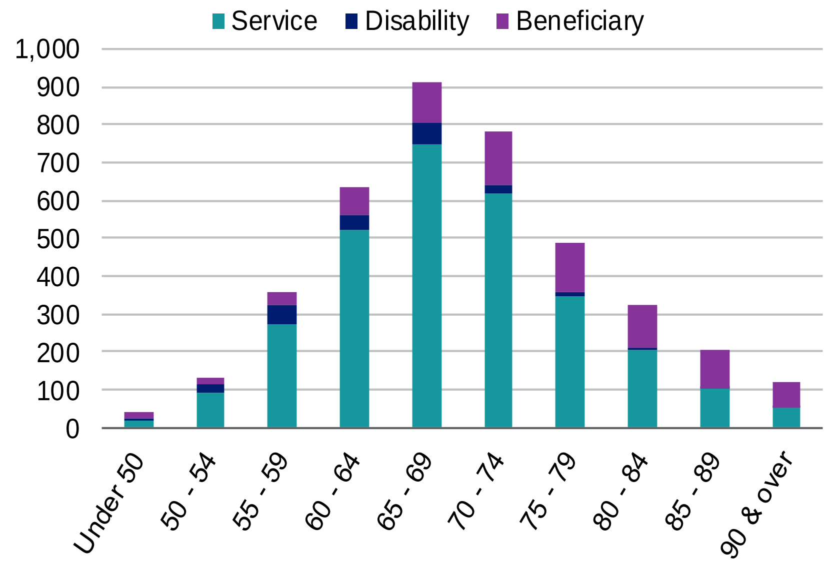
As of June 30, 2019, the average monthly benefit for retired participants and beneficiaries is $2,598, compared to $2,525 in the previous valuation. The average age for retired participants and beneficiaries is 70.4 in the current valuation, compared with 70.1 in the prior valuation.

Distribution of Pensioners and Beneficiaries as of June 30, 2019

Pensioners and Beneficiaries by Type and Monthly Amount



Pensioners and Beneficiaries by Type and Age



Historical plan population

The chart below demonstrates the progression of the active population over the last ten years. The chart also shows the changes among the retired population over the same time period.

Participant Data Statistics: 2010 – 2019

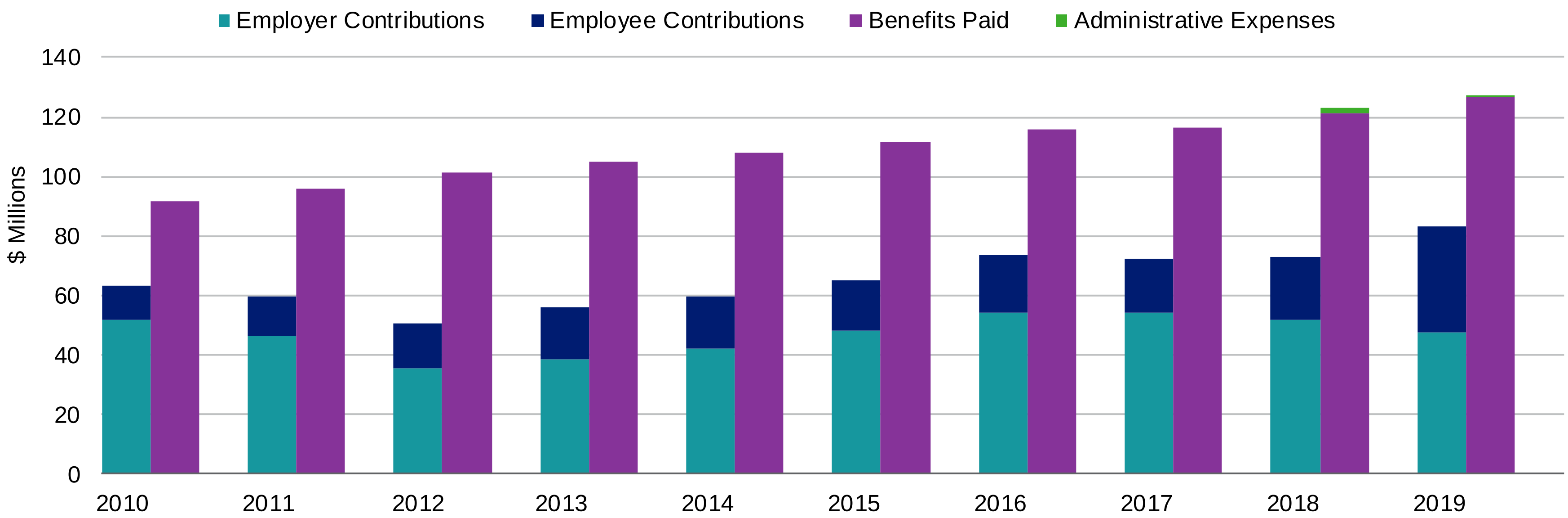
	Active Participants			Retired Participants and Beneficiaries		
Year Ended June 30	**Count**	**Average Age**	**Average Service**	**Count**	**Average Age**	**Average Monthly Amount**
2010	3,261	46.6	11.7	3,605	67.6	$2,047
2011	3,093	47.3	12.8	3,765	67.5	2,119
2012	3,159	47.2	12.5	3,826	67.7	2,210
2013	3,171	47.3	12.5	3,790	68.0	2,293
2014	3,243	47.4	12.4	3,805	68.3	2,342
2015	3,307	47.3	12.0	3,834	68.7	2,387
2016	3,452	46.8	11.2	3,874	69.3	2,417
2017	3,688	46.4	10.7	3,889	69.8	2,455
2018	3,830	46.3	10.4	3,920	70.1	2,525
2019	3,674	46.3	10.3	3,991	70.4	2,598

Financial information

Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and investment earnings (less investment fees) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of transactions for the valuation year, is presented in *Section 3, Exhibits D, E* and *F*.

Comparison of Contributions Made with Benefits and Expenses Paid for Years Ended June 30, 2010 – 2019*



*Prior to 2018, investment earnings were net of investment fees and administrative expenses.

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

Determination of Actuarial Value of Assets for Year Ended June 30, 2019

1	Market value of assets, June 30, 2019				$1,333,862,000
		Original	**Percent**	**Unrecognized**	
2	Calculation of unrecognized return	**Amount[1]**	**Deferred**	**Amount[2]**	
(a)	Year ended June 30, 2019	-$15,375,919	80%	-$12,300,735	
(b)	Year ended June 30, 2018	34,365,719	60	20,619,432	
(c)	Year ended June 30, 2017	68,568,900	40	27,427,560	
(d)	Year ended June 30, 2016	-79,572,275	20	-15,914,455	
(e)	Year ended June 30, 2015	-29,016,925	0	0	
(f)	Total unrecognized return				19,831,802
3	Preliminary actuarial value: **(1) - (2f)**				$1,314,030,198
4	Adjustment to be within 20% corridor				0
5	Final actuarial value of assets as of June 30, 2019: **(3) + (4)**				1,314,030,198
6	Actuarial value as a percentage of market value: **(5) ÷ (1)**				98.51%
7	Amount deferred for future recognition **(1) - (5)[3]**				$19,831,802

[1]Total return minus expected return on a market value basis
[2]Recognition at 20% per year over five years

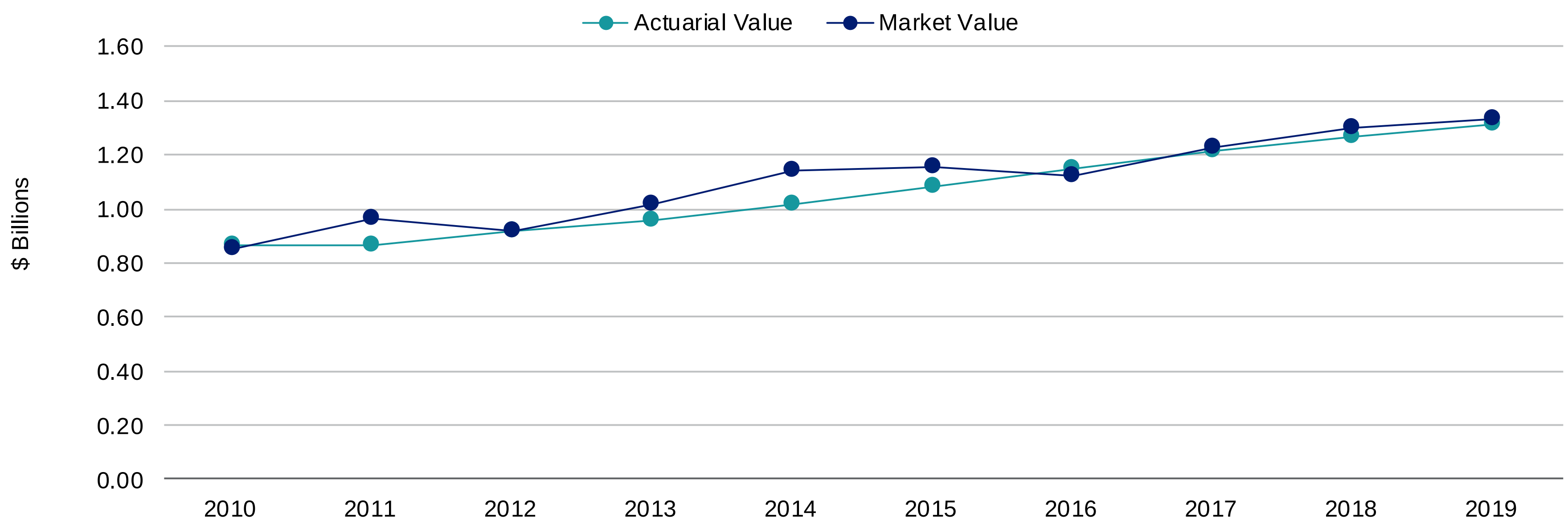
[3]Deferred return as of June 30, 2019 recognized in each of the next four years:

(a) Amount recognized on June 30, 2020	$1,597,286
(b) Amount recognized on June 30, 2021	17,511,740
(c) Amount recognized on June 30, 2022	3,797,960
(d) Amount recognized on June 30, 2023	-3,075,184

Section 2: Actuarial Valuation Results

Both the actuarial value and market value of assets are representations of the Fund's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Fund's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

Actuarial Value of Assets vs. Market Value of Assets as of June 30, 2010 – 2019



Actuarial experience

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

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total gain is $541,408, which includes $1,958,483 from investment losses and $2,499,891 in gains from all other sources. The net experience variation from individual sources other than investments was 0.1% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

Actuarial Experience for Year Ended June 30, 2019

1	Net loss from investments*	-$1,958,483
2	Net gain from administrative expenses	454,325
3	Net gain from other experience	2,045,566
4	Net experience gain: **1 + 2 + 3**	$541,408

* Details on next page.

Investment experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Fund's investment policy. The rate of return on the market value of assets was 6.05% for the year ended June 30, 2019.

For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.25%. The actual rate of return on an actuarial basis for the 2018-2019 plan year was 7.09%. Since the actual return for the year was less than the assumed return, the Fund experienced an actuarial loss during the year ended June 30, 2019 with regard to its investments.

Investment Experience

		Year Ended June 30, 2019		Year Ended June 30, 2018	
		Market Value	**Actuarial Value**	**Market Value**	**Actuarial Value**
1	Net investment income	$77,334,000	$88,503,818	$121,682,000	$107,247,510
2	Average value of assets	1,278,757,500	1,247,755,880	1,204,362,500	1,187,795,370
3	Rate of return: **1 ÷ 2**	6.05%	7.09%	10.10%	9.03%
4	Assumed rate of return	7.25%	7.25%	7.25%	7.25%
5	Expected investment income: **2 x 4**	92,709,919	90,462,301	87,316,281	86,115,164
6	Actuarial gain/(loss): **1 - 5**	-$15,375,919	-$1,958,483	$34,365,719	$21,132,346

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the actual market value investment return for the last 20 years, including averages over select time periods.

Investment Return – Actuarial Value vs. Market Value: 1999 - 2019

	Actuarial Value Investment Return		Market Value Investment Return			Actuarial Value Investment Return		Market Value Investment Return	
Year Ended June 30[1]	Amount	Percent	Amount	Percent	Year Ended June 30	Amount	Percent	Amount	Percent
1999	$51,690,000	7.78%	$51,690,000	7.78%	2010	$13,845,996	1.60%	$96,241,481	12.53%
2000	116,042,400	9.67	18,124,000	2.61	2011	38,679,811	4.56	149,657,731	17.98
2001	-4,178,800	-0.56	-12,887,000	-1.86	2012	21,039,393	2.49	4,967,000	0.53
2002	-13,112,400	-1.82	-50,686,000	-7.67	2013	86,311,648	9.66	145,776,000	16.32
2003	1,312,772	0.19	89,769,919	15.12	2014	110,185,508	11.84	179,568,000	18.14
2004	12,001,697	1.78	68,415,406	10.24	2015	114,271,773	11.51	55,130,000	4.91
2005	19,984,377	2.93	654,115	0.09	2016	99,369,668	9.32	5,587,000	0.49
2007[2]	50,849,393	4.78	101,463,275	9.06	2017	110,465,273	9.82	151,110,000	13.73
2008	50,125,917	6.45	-27,014,531	-3.15	2018	107,247,510	9.03	121,682,000	10.10
2009	11,812,857	1.36	-90,617,329	-10.39	2019	88,503,818	7.09	77,334,000	6.05
						Most recent five-year average return	9.25%		7.03%
						Most recent ten-year average return	7.90%		9.62%
						Most recent 15-year average return	6.64%		7.17%
						Most recent 20-year average return	6.18%		6.38%

Note: Each year's yield is weighted by the average asset value in that year.

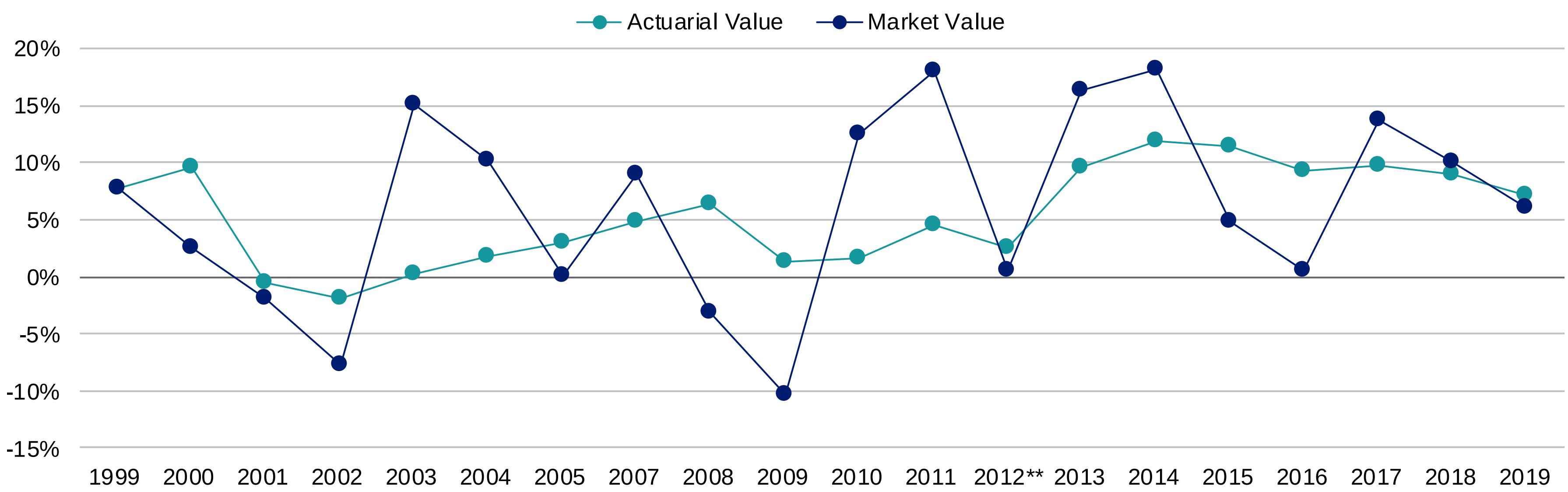
[1] Prior to 2007, financial information was based on 12-month periods ending December 31.

[2] The amounts for the year ended June 30, 2007 represent an 18-month period from January 1, 2006 through June 30, 2007. The percentages shown have been annualized.

Section 2: Actuarial Valuation Results

As described earlier in this section, the actuarial asset valuation method gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

Market and Actuarial Rates of Return for Years* Ended June 30, 1999 - 2019



* Prior to 2007, financial information was based on 12-month periods ending December 31.

** Actuarial value rate of return before method change.

Non-investment experience

Administrative expenses

- Administrative expenses for the year ended June 30, 2019 totaled $832,000, as compared to the assumption of $1,227,000. This resulted in a gain of $454,325 for the year. Because it is expected that these expenses will continue to increase, the actuarial assumption includes an annual 2.25% inflationary increase.

Mortality experience

- Mortality experience (more or fewer than expected deaths) yields actuarial gains or losses.
- The mortality assumption was last updated with the July 1, 2017 valuation. We will be reviewing the experience again with the study scheduled for later this year.

Other experience

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

- the extent of turnover among participants,
- retirement experience (earlier or later than projected),
- the number of disability retirements (more or fewer than projected), and
- salary increases (greater or smaller than projected).

The net gain from this other experience for the year ended June 30, 2019 amounted to $2,045,566, which is 0.1% of the actuarial accrued liability.

Actuarial assumptions

There are no assumption changes reflected in this report:

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

Plan provisions

There were no changes in plan provisions since the prior valuation.

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

Development of Unfunded Actuarial Accrued Liability for Year Ended June 30, 2019

1	Unfunded actuarial accrued liability at beginning of year		$595,952,148
2	Normal cost at beginning of year		24,511,023
3	Total contributions		-82,859,000
4	Interest		
	• For whole year on **1 + 2**	$44,983,580	
	• For half year on **3**	-3,003,639	
	Total interest		41,979,941
5	Expected unfunded actuarial accrued liability		$579,584,112
6	Changes due to experience gains and losses		-$541,408
7	Unfunded actuarial accrued liability at end of year		$579,042,704

Actuarially determined contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded actuarial accrued liability. As of July 1, 2019, the actuarially determined contribution is $48,763,497, or 25.84% of projected payroll.

The City sets the methodology used to calculate the actuarially determined contribution based on a closed level percentage of payroll amortization period of 30 years, established with the July 1, 2010 valuation. As of July 1, 2019, there are 21 years remaining on this schedule.

The contribution requirement for the 2020-2021 fiscal year is based on the data previously described, the actuarial assumptions and plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

Actuarially Determined Contribution for Fiscal Year Beginning July 1

		2020		2019	
		Amount	**% of Projected Payroll**	**Amount**	**% of Projected Payroll**
1.	Total normal cost	$23,335,331	12.36%	$23,284,023	12.32%
2.	Administrative expenses	1,254,607	0.66%	1,227,000	0.65%
3.	Expected employee contributions	-18,975,672	-10.05%	-19,390,874	-10.26%
4.	Employer normal cost: (1) + (2) + (3)	$5,614,266	2.97%	$5,120,149	2.71%
5.	Actuarial accrued liability	$1,893,072,902		$1,865,937,528	
6.	Actuarial value of assets	1,314,030,198		1,269,985,380	
7.	Unfunded actuarial accrued liability: (5) - (6)	$579,042,704		$595,952,148	
8.	Payment on unfunded actuarial accrued liability	40,100,759	21.25%	40,084,242	21.22%
9.	Adjustment for timing*	3,048,472	1.62%	3,014,420	1.59%
10.	Actuarially determined contribution: (4) + (8) + (9)	$48,763,497	25.84%	$48,218,811	25.52%
11.	Projected payroll	$188,718,811		$188,916,062	

*Actuarially determined contributions are assumed to be paid at the middle of every year. Calculated as {[(4) + (8)] x [1.0725 ^ 0.50] x 1.03} – (4) – (8).

Reconciliation of actuarially determined contribution

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

Reconciliation of Actuarially Determined Contribution for Fiscal Year Ending 2020 to 2021

	Amount
Actuarially Determined Contribution as of July 1, 2019	$48,218,811
• Effect of expected change in amortization payment due to payroll growth	1,282,717
• Effect of contributions more than actuarially determined contribution	-1,225,104
• Effect of gains and losses on accrued liability	-184,671
• Effect of investment loss	144,676
• Effect of scheduled change in assumed administrative expense assumption	29,449
• Net effect of other changes, including composition and number of participants	497,619
Total change	$544,686
Actuarially Determined Contribution as of July 1, 2020	$48,763,497

History of employer contributions

A history of the most recent years of contributions is shown below.

History of Employer Contributions: 2011 – 2020

Fiscal Year Ended June 30	Actuarially Determined Employer Contribution (ADEC)*	Actual Employer Contribution	Percent Contributed
2011	$46,067,793	$46,078,000	100.02%
2012	35,237,651	35,237,000	100.00%
2013	38,688,054	38,694,000	100.02%
2014	42,145,284	42,145,000	100.00%
2015	47,969,283	48,015,000	100.10%
2016	54,235,740	54,236,000	100.00%
2017	53,815,973	53,817,000	100.00%
2018	51,902,994	51,903,000	100.00%
2019	47,220,491	47,220,000	100.00%
2020	48,218,811	--	--

*Prior to GASB67/68, this amount was the Annual Required Contribution (ARC).

Risk

Since the actuarial valuation results are dependent on a given set of assumptions and data as of a specific date, there is a risk that emerging results may differ significantly as actual experience differs from the assumptions.

This report does not contain a detailed analysis of the potential range of future measurements, but does include a brief discussion of some risks that may affect the Fund. A more detailed assessment would provide the Trustees with a better understanding of the risks inherent in the Fund. This assessment may include scenario testing, sensitivity testing, stress testing and stochastic modeling.

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

  Since the Fund's assets are much larger than contributions, investment performance may create volatility in contribution requirements.

  The market value rate of return over the last 20 years has ranged from a low of -10.39% to a high of 18.14%.

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

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

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

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

  As part of the funding policy, if the valuation results calculated under the actuarial assumptions and methods in effect at the time of the 2011 Pension Reform would result in the Actual Required Contribution (ARC) exceeding 35% of total payroll (the "cap"), a Cost Recovery Plan would be implemented to reduce the ARC to no more than 35%. A Cost Recovery Plan can include increasing the City or employee contributions, modifying person benefits, or using alternative funding sources. To date a Cost Recovery Plan has not needed to be implemented.

Section 2: Actuarial Valuation Results

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

  Examples of this risk include:

  - Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.
  - More or less active participant turnover than assumed.

  While it is difficult to quantify the impact of potential experience, for your Fund, each 1% change in the actuarial cost factors would result in a change in this year’s recommended contribution of $1.6 million, or 0.87% of projected payroll.

- Actual Experience Over the Last Ten Years and Implications for the Future

  Past experience can help demonstrate the sensitivity of key results to the Fund’s actual experience. Over the past ten years:

  The investment gain/(loss) on a market value basis for a year has ranged from a loss of $79,572,275 in 2016 to a gain of $105,310,725 in 2014.

  The investment gain/(loss) on an actuarial value basis has ranged from a loss of $55,516,760 in 2010 to a gain of $40,388,059 in 2014.

  The funded percentage on the market value of assets has ranged from a low of 51.02% as of July 1, 2012 to a high of 70.46% as of July 1, 2019.

  The funded percentage on the actuarial value of assets has ranged from a low of 51.02% as of July 1, 2012 to a high of 69.41% as of July 1, 2019.

- Maturity Measures

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

  Currently the Fund has a non-active to active participant ratio of 1.12. For the prior year benefits paid and administrative expenses were $44,464,000 more than contributions received. As the Fund matures, more cash will be needed from the investment portfolio to meet benefit payments.

GFOA funded liability by type

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

GFOA Solvency Test as of June 30

	2019	2018
Actuarial accrued liability (AAL)		
• Active member contributions	$149,115,925	$143,107,418
• Retirees and beneficiaries	1,360,458,932	1,304,996,100
• Active and inactive members (employer-financed)	383,498,045	417,834,010
Total	$1,893,072,902	$1,865,937,528
Actuarial value of assets	$1,314,030,198	$1,269,985,380
Cumulative portion of AAL covered		
• Active member contributions	100.00%	100.00%
• Retirees and beneficiaries	85.63%	86.35%
• Active and inactive members (employer-financed)	0.00%	0.00%

Actuarial balance sheet

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

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

Actuarial Balance Sheet

	Year Ended	
	June 30, 2019	**June 30, 2018**
Liabilities		
• Present value of benefits for retired participants and beneficiaries	$1,360,458,932	$1,304,996,100
• Present value of benefits for inactive vested participants	18,940,913	11,328,729
• Present value of benefits for active participants	686,912,758	723,173,934
Total liabilities	**$2,066,312,603**	**$2,039,498,763**
Assets		
• Total valuation value of assets	$1,314,030,198	$1,269,985,380
• Present value of future contributions by members	151,796,597	153,860,639
• Present value of future employer contributions for:		
• Entry age cost	21,443,104	19,700,596
• Unfunded actuarial accrued liability	579,042,704	595,952,148
Total of current and future assets	**$2,066,312,603**	**$2,039,498,763**

Actuarial Present Value of Accumulated Plan Benefits

The actuarial present value of accumulated plan benefits is shown below as of July 1, 2019 and as of July 1, 2018.

ACTUARIAL PRESENT VALUE OF ACCUMULATED PLAN BENEFITS

	Benefit Information Date	
	July 1, 2019	**July 1, 2018**
Actuarial present value of vested accumulated plan benefits:		
› Participants currently receiving payments	$1,360,458,932	$1,304,996,100
› Other vested benefits	370,664,476	384,859,786
› Total vested benefits (PVVB)	1,731,123,408	1,689,855,886
Actuarial present value of non-vested accumulated plan benefits	44,095,616	48,874,419
Total actuarial present value of accumulated plan benefits (PVAB)	$1,775,219,024	$1,738,730,305
Actuarial Value of Assets (AVA)	$1,314,030,198	$1,269,985,380
Market Value of Assets (MVA)	$1,333,862,000	$1,300,987,000
Funded Ratios (PVVB):		
› AVA as a percentage of present value of vested accumulated benefits	75.91%	75.15%
› MVA as a percentage of present value of vested accumulated benefits	77.05%	76.99%
Funded Ratios (PVAB):		
› AVA as a percentage of present value of accumulated benefits	74.02%	73.04%
› MVA as a percentage of present value of accumulated benefits	75.14%	74.82%

Note: The amounts stated as vested benefits include employee contribution accounts, which are considered 100% vested.

The factors that affected the change in the actuarial present value of accumulated plan benefits from the preceding to the current benefit information date are as follows:

Factors	Change in Actuarial Present Value of Accumulated Plan Benefits
Benefits accumulated, net experience gain or loss, changes in data	$41,507,071
Benefits paid	-126,491,000
Interest	121,472,648
Total	$36,488,719

State minimum requirements

Under Georgia minimum funding requirements, the liability may be amortized as a percent of payroll, rather than a fixed dollar amount. In general, with fixed dollar amortization, actual experience close to the assumptions will result in a total contribution requirement (the normal cost plus the payment on the unfunded actuarial liability) that decreases over time as a percentage of payroll. With percentage of payroll amortization, given expected experience, the total contribution requirement should remain level as a percentage of payroll.

Prior to the 2005 valuation, the Plan had adopted the policy of amortizing the unfunded actuarial liability as a level percentage of payroll over a closed 40-year period from January 1, 1979. At January 1, 2005, the amortization was reset to a closed 20-year period. Effective July 1, 2008, the amortization period was changed to an open 30-year period and effective July 1, 2010, the amortization period was changed to a closed 30-year period. The contributions determined under this method continue to meet the Georgia minimum funding requirements by virtue of Georgia Code Section 47-20-10(b).

Supplemental Information

Exhibit A: Table of Plan Coverage

Category	Year Ended June 30 2019	 2018	Change From Prior Year
Active participants in valuation:			
• Number	3,674	3,830	-4.1%
• Average age	46.3	46.3	0.0
• Average years of service	10.3	10.4	-0.1
• Total payroll	$183,222,147	$183,413,652	-0.1%
• Average payroll	49,870	47,889	4.1%
• Account balances	149,115,925	143,107,418	4.2%
• Total active vested participants	2,116	2,209	-4.2%
Inactive participants:			
Number of vested terminated participants	125	81	54.3%
Number of inactive nonvested participants due a refund	759	533	42.4%
Retired participants:			
• Number in pay status	2,967	2,899	2.3%
• Average age	69.5	69.3	0.2
• Average monthly benefit	$2,869	$2,805	2.3%
• Number in suspended status	10	8	25.0%
Disabled participants:			
• Number in pay status	226	230	-1.7%
• Average age	64.0	63.5	0.5
• Average monthly benefit	$1,998	$1,936	3.2%
Beneficiaries:			
• Number in pay status	788	783	0.6%
• Average age	75.5	75.1	0.4
• Average monthly benefit	$1,758	$1,666	5.5%

Exhibit B: Participants in Active Service as of June 30, 2019 by Age, Years of Service, and Average Payroll

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	93	93	- -	- -	- -	- -	- -	- -	- -	- -
	$40,532	$40,532	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	311	290	21	- -	- -	- -	- -	- -	- -	- -
	42,864	42,526	$47,527	- -	- -	- -	- -	- -	- -	- -
30 - 34	404	309	74	21	- -	- -	- -	- -	- -	- -
	44,244	42,944	48,030	$50,023	- -	- -	- -	- -	- -	- -
35 - 39	345	191	62	72	20	- -	- -	- -	- -	- -
	47,572	42,383	52,085	56,792	$49,938	- -	- -	- -	- -	- -
40 - 44	424	170	77	106	46	25	- -	- -	- -	- -
	49,692	43,615	50,572	57,003	54,150	$49,110	- -	- -	- -	- -
45 - 49	552	197	90	92	60	75	38	- -	- -	- -
	51,800	44,431	49,162	58,199	54,480	61,854	$56,681	- -	- -	- -
50 - 54	570	134	104	100	64	85	71	12	- -	- -
	51,943	42,709	46,000	55,079	60,140	55,201	59,411	$69,439	- -	- -
55 - 59	520	111	75	74	66	78	86	26	4	- -
	53,200	43,823	46,025	58,381	55,188	56,894	58,742	63,671	$60,058	- -
60 - 64	306	47	51	56	56	35	36	17	5	3
	55,186	41,512	42,209	58,059	61,799	67,750	54,242	62,950	91,134	$73,809
65 - 69	117	16	16	19	17	17	10	9	5	8
	52,798	45,802	45,243	54,979	62,283	49,887	52,479	56,345	61,219	53,896
70 & over	32	- -	2	7	5	4	5	3	3	3
	57,376	- -	54,292	57,720	53,831	49,425	79,391	41,528	56,283	55,387
Total	3,674	1,558	572	547	334	319	246	67	17	14
	$49,870	$42,943	$47,765	$56,790	$57,002	$57,723	$58,123	$62,546	$68,873	$58,482

Exhibit C: Reconciliation of Participant Data

	Active Participants	Inactive Vested Participants[1]	Disableds	Retired Participants	Beneficiaries	Total
Number as of July 1, 2018	**3,830**	**81**	**230**	**2,907**	**783**	**7,831**
• New participants[2]	455	N/A	N/A	N/A	N/A	455
• Terminations – with vested rights	-53	53	0	0	0	0
• Terminations – without vested rights	-186	N/A	N/A	N/A	N/A	-186
• Retirements	-158	-2	N/A	160	N/A	0
• New disabilities	-4	-1	5	N/A	N/A	0
• Return to work	4	-4	0	0	N/A	0
• Deceased	-12	0	-9	-91	-45	-157
• New beneficiaries	0	0	0	0	51	51
• Lump sum cash-outs	-202	-2	0	0	0	-204
• Certain period expired	N/A	N/A	0	0	0	0
• Data adjustments[3]	0	0	0	1	-1	0
Number as of July 1, 2019	**3,674**	**125**	**226**	**2,977**	**788**	**7,790**

[1] Excludes terminated participants with contributions remaining in the plan.
[2] 268 of the 455 new active participants included in the data for the first time this year have over one year of service.
[3] The following data adjustments were made per the TPA:

One healthy retiree was included for the first time with this valuation.
One beneficiary's pension was suspended.

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

	Year Ended June 30, 2019		Year Ended June 30, 2018	
Net assets at market value at the beginning of the year		$1,300,987,000		$1,229,420,000
Contribution income:				
• Employer contributions	$47,220,000		$51,903,000	
• Employer contributions	35,639,000		20,671,000	
• Less administrative expenses	-832,000		-1,806,000	
Net contribution income		*$82,027,000*		*$70,768,000*
Other income		$5,000		$110,000
Investment income:				
• Asset appreciation	$63,615,000		$112,072,000	
• Interest, dividends and other income	17,347,000		13,430,000	
• Less investment fees	-3,628,000		-3,820,000	
Net investment income		*$77,334,000*		*$121,682,000*
Total income available for benefits		**$159,366,000**		**$192,560,000**
Less benefit payments		*-$126,491,000*		*-$120,993,000*
Change in reserve for future benefits		**$32,875,000**		**$71,567,000**
Net assets at market value at the end of the year		**$1,333,862,000**		**$1,300,987,000**

Exhibit E: Asset Allocation as of June 30, 2019

	General Employees	School Board	Total
1. Market value of assets as of July 1, 2018	**$1,300,987,000**	**$155,112,000**	**$1,456,099,000**
2. Employer contributions	$47,220,000	$55,002,000	$102,222,000
3. Employee contributions	35,639,000	1,686,000	37,325,000
4. Other income not in yields	5,000	0	5,000
5. Total contributions and other income: (2) + (3) + (4)	$82,864,000	$56,688,000	$139,552,000
6. Benefit payments and refunds	-$126,491,000	-$51,216,000	-$177,707,000
7. Administrative expenses	-832,000	-227,000	-1,059,000
8. Total benefit payments and expenses: (6) + (7)	-$127,323,000	-$51,443,000	-$178,766,000
9. Net cash flow: (5) + (8)	-$44,459,000	$5,245,000	-$39,214,000
10. Net investment return	77,334,000	8,639,000	85,973,000
11. Market value of assets as of July 1, 2019: (1) + (9) + (10)	**$1,333,862,000**	**$168,996,000**	**$1,502,858,000**

Exhibit F: Development of the Fund through June 30, 2019

Year Ended June 30	Employer Contributions	Employee Contributions	Net Investment Return[1]	Admin. Expenses	Benefit Payments	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2010	$51,761,766	$11,616,599	$96,241,481	$0	$91,327,372	$850,644,269	$866,905,943	101.91%
2011	46,078,000	13,230,000	149,657,731	0	96,095,000	963,515,000	868,798,754	90.17%
2012	35,237,000	15,142,000	4,967,000	0	101,375,000	917,486,000	917,486,000	100.00%
2013	38,694,000	17,322,000	145,776,000	0	104,849,000	1,014,429,000	954,964,648	94.14%
2014	42,145,000	17,366,000	179,568,000	0	108,175,000	1,145,333,000	1,016,486,156	88.75%
2015	48,015,000	16,975,000	55,130,000	0	111,738,000	1,153,715,000	1,084,009,929	93.96%
2016	54,236,000	19,173,000	11,293,000[2]	0	115,631,000	1,122,786,000	1,146,863,597	102.14%
2017	53,817,000	18,243,000	151,110,000	0	116,536,000	1,229,420,000	1,212,852,870	98.65%
2018	51,903,000	20,671,000	121,682,000[3]	1,806,000	120,993,000	1,300,987,000[4]	1,269,985,380	97.62%
2019	47,220,000	35,639,000	77,334,000	832,000	126,491,000	1,333,862,000[5]	1,314,030,198	98.51%

[1]On a market basis, net of investment fees (and administrative expenses prior to 2018)
[2]Includes $5,706,000 asset adjustment
[3]Includes $155,000 asset adjustment
[4]Includes an additional $110,000 in other income not in yields
[5]Includes an additional $5,000 in other income not in yields

Exhibit G: Definition of Pension Terms

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

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

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

Section 3: Supplemental Information

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Fund is calculated, including: Investment return - the rate of investment yield that the Fund will earn over the long-term future; Mortality rates - the death rates of employees and pensioners; life expectancy is based on these rates; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the probability of disability retirement at a given age; Withdrawal rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation and productivity growth.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
Funded Ratio:	The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Section 3: Supplemental Information

GASB 67 and GASB 68:	Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.
Investment Return:	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Net Pension Liability (NPL):	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the actuarial assumptions are realized.
Plan Fiduciary Net Position:	Market value of assets.
Total Pension Liability (TPL):	The actuarial accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

Actuarial Valuation Basis

Exhibit I: Actuarial Assumptions and Actuarial Cost Method

Rationale for Assumptions:	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Review of Actuarial Experience for the five year period ended June 30, 2016 dated June 7, 2017.
Net Investment Return:	7.25%, the investment return rate is assumed to be net of investment expenses. The net investment return assumption was chosen by the Pension Fund's Board of Trustees, with input from the actuary. This assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment. As part of the analysis, a building block approach was used that reflects inflation expectations and anticipated risk premiums for each of the portfolio's asset classes, as well as the Fund's target asset allocation.
Administrative Expenses:	$1,200,000 per year, projected annually with 2.25% inflation. As of July 1, 2019, the assumed annual expense is $1,254,607. The annual administrative expenses were based on historical and current data and adjusted to reflect estimated future experience and professional judgment.
Salary Increases:	See table below.
Vacation Pay Adjustment:	Retirement benefits are increased by 4% to reflect vacation pay.
Payroll Growth:	3.00%, used to amortize the unfunded actuarial accrued liability as a level percentage of payroll.

Salary Increases:

Age	Rate (%)
Under 25	14.75
25 - 29	11.75
30 - 34	8.75
35 - 39	6.75
40 - 44	5.75
45 - 49	5.00
50 - 54	4.25
55 - 59	3.75
60 - 64	3.25
65 & over	3.00

Salary increases include an assumed inflation rate of 2.25% and 0.75% productivity.

Section 4: Actuarial Valuation Basis

Cost-of-Living Adjustments:	2.25%, compounded annually after retirement for hires before November 1, 2011 1.00%, compounded annually after retirement for hires after October 31, 2011
Mortality Rates:	
Pre-retirement:	Approximate RP-2006 Blue Collar Employee Table, loaded by 25% with sex-distinct rates and projected generationally with scale SSA2016-2D
Healthy annuitants:	Approximate RP-2006 Blue Collar Healthy Annuitant Table, loaded by 25% with sex-distinct rates and projected generationally with scale SSA2016-2D
Disabled annuitants:	Approximate RP-2006 Disabled Retiree Mortality Table, loaded by 25% with sex-distinct rates and projected generationally with scale SSA2016-2D
	Based on a five-year experience study for the period ended June 30, 2016, the above tables reasonably reflect the mortality experience of the Fund. The mortality tables are adjusted to future years using generational projection under scale SSA2016-2D to reflect expected mortality improvement.

Annuitant Mortality Rates:

	Rate (%)			
	Healthy*		Disabled*	
Age	Male	Female	Male	Female
55	0.80	0.52	3.11	1.88
60	1.12	0.82	3.51	2.43
65	1.81	1.32	4.54	3.16
70	2.98	2.12	6.10	4.28
75	4.86	3.44	8.38	6.14
80	7.98	5.67	11.78	9.07
85	13.13	9.75	17.14	13.56
90	21.64	16.72	25.57	19.83

**Rates shown do not include generational projection.*

Mortality and Disability Rates before Retirement:

	Rate (%)			
	Healthy[1]		Ordinary Disability[2]	
Age	Male	Female	Male	Female
20	0.08	0.03	0.00	0.00
25	0.09	0.03	0.00	0.00
30	0.08	0.03	0.00	0.00
35	0.09	0.04	0.09	0.09
40	0.12	0.07	0.14	0.13
45	0.20	0.11	0.22	0.20
50	0.32	0.16	0.37	0.32
55	0.48	0.24	0.64	0.54
60	0.80	0.39	0.95	0.66

[1]Rates shown do not include generational projection.
[2]Occupational disability rates are 10% of the ordinary disability rates.

Termination Rates Before Retirement:

Years of Service	Rate (%)[3]
Less than 1	18.00
1	15.00
2	12.00
3	11.00
4	10.00
5	9.00
6	7.00
7	7.00
8	6.50
9	5.50
10	5.00
11	4.50
12	4.00
13	3.50
14	3.00
15 or more	2.50

[3]Withdrawal rates do not apply at or beyond the later of eligibility for early retirement or age 55.

Retirement Rates:

Less than 30 Years of Service		30 or More Years of Service	
Age	**Rate**	**Age**	**Rate**
50-52	2%	50-52	30%
53-54	3	53-54	30
55	5	55	30
56	6	56	30
57	6	57	35
58-59	7	58-59	35
60	20	60	35
61-64	15	61-64	20
65-66	25	65-66	25
67-68	15	67-68	25
69	25	69	25
70	100	70	100

The retirement rates were based on historical and current demographic data, adjusted to reflect estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of retirements by age and the projected number based on the prior year's assumption over the five-year period ended June 30, 2016.

Weighted Average Retirement Age:

Age 61.6, determined as follows: The weighted average retirement age for each participant is calculated as the sum of the product of each potential current or future retirement age times the probability of surviving from current age to that age and then retiring at that age, assuming no other decrements. The overall weighted retirement age is the average of the individual retirement ages based on all the active participants included in the July 1, 2019 actuarial valuation.

Retirement Rates for Vested Inactive Participants:

Age 60

Unknown Data for Participants:

There were no records that were missing both service amounts and dates of hire. For participants with less than one year of benefit service, salaries were annualized.

Additional Accumulated Unused Sick Leave at Retirement:

None

Percent Married:

75%

Section 4: Actuarial Valuation Basis

Form of Payment:	Married participants hired prior to November 1, 2011 are assumed to elect a 75% joint and survivor annuity. Unmarried participants hired prior to November 1, 2011 and all participants hired after October 31, 2011 are assumed to elect a life annuity.
Age of Spouse:	Females are assumed to be three years younger than their male spouses.
Refunds of Employee Contributions for Terminated Vested Participants:	75% of participants hired before November 1, 2011 elect a refund of their employee contribution balances. 100% of participants hired after October 31, 2011 elect a refund of their employee contribution balances.
Actuarial Value of Assets:	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary.
Justification for Change in Actuarial Assumptions:	There have been no changes in actuarial assumptions or methods since the last valuation.

Exhibit II: Summary of Plan Provisions

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

Plan Year:	July 1 through June 30
Plan Status:	Ongoing
Normal Pension:	
Eligibility:	
Hired before July 1, 2010	Age 60 after completing 10 years of service.
Hired between July 1, 2010 and October 31, 2011	Age 60 after completing 15 years of service.
Hired after October 31, 2011	Age 62 after completing 15 years of service.
Monthly Amount:	
Hired before July 1, 2010	2.5% of average monthly salary for each year of service.
Hired between July 1, 2010 and October 31, 2011	2.0% of average monthly salary for each year of service.
Hired after October 31, 2011	1.0% of average monthly salary for each year of service. This amount cannot be less than $12 per month for each year of service, capped at 80% of average monthly salary.
Average Monthly Salary:	
Hired before November 1, 2011	Average of the highest consecutive 36 months of salary
Hired after October 31, 2011	Average of the highest consecutive 120 months of salary
Normal Form of Payment:	
Hired prior to November 1, 2011	75% Joint-and-Survivor (no reduction in benefit for providing survivor coverage)
Hired after October 31, 2011	Single life annuity

Early Retirement:	
Service Requirement	
Hired before July 1, 2010	10 years of service
Hired between July 1, 2010 and October 31, 2011	15 years of service
Hired after October 31, 2011	Age 52 and 15 years of service
Monthly Amount	
Hired before November 1, 2011	Normal pension monthly amount reduced by ½ of 1% per month for the first 60 months and by ¼ of 1% per month for the remaining months by which age at retirement is less than 60. More favorable early retirement adjustments may apply to participants in prior plans. Unreduced early retirement is available with 30 years of service.
Hired after October 31, 2011	Normal pension monthly amount reduced by ½ of 1% per month before age 62.
Disability:	
Service Requirement	5 years of service for non-job-related disability. None for job related disability.
Monthly Amount	Normal pension based on service accrued and final average salary at disability, payable immediately; cannot be less than 50% of average monthly salary. This amount is payable until attainment of normal retirement age at which time the benefit is recalculated to include years while disabled as years of service.
Vesting:	An employee who terminates employment may receive a percentage of the accrued benefit payable at normal retirement as determined below:

	Percentage Vested*	
Completed Years of Service	**Hired before July 1, 2010**	**Hired after June 30, 2010**
Less than 5	0%	0%
5	25	25
6	30	30
7	35	35
8	40	40
9	45	45
10	100	50
11	100	55
12	100	60
13	100	65
14	100	70
15 or more	100	100

**A participant is always 100% vested in their contributions to the Fund.*

Section 4: Actuarial Valuation Basis

Termination:	A participant terminating employment may elect a refund of their own contributions with interest. A refund will cause the forfeiture of any other vested accrued benefit from the Fund.
Death Benefits:	If a participant dies prior to attainment of eligibility for retirement, a lump sum of contributions with interest is payable to a beneficiary or estate. If an active participant who is eligible to retire, or a retired participant, dies, 75% of the accrued pension benefit is payable to the beneficiary. Eligible beneficiaries are the spouse or unmarried children under 23 (18 if not in post-secondary school).
Credited Service:	Service is credited for employment as a general employee of the City of Atlanta. Additional credit is granted for accumulated sick leave if hired prior to November 1, 2011 and for other prior service as specified in the plan.
Participation:	All employees of the City of Atlanta, excluding temporary employees, firefighters, police officers, and employees hired after 2001 in job grades 19 and above. Also includes employees hired between 2001 and 2005 in any job grade who elected to transfer from the Defined Contribution plan to this Fund and who agreed to roll over their DC plan balances to this Fund and pay additional contributions as if they had been participants in this Fund from date of hire.
Employee Contributions:	(see table below)

Employee Contributions:

	% of Base Salary	
Employee	**Hired before November 1, 2011***	**Hired after October 31, 2011***
Unmarried employees without beneficiaries	12%	8%
Unmarried employees with beneficiaries	13%	8%
Married employees	13%	8%

**Excludes employees hired prior to January 1, 1984.*

Interest on Employee Contributions:	Employee contributions earn 5% interest each year.
Cost of Living Provision:	Benefits for retirees and beneficiaries are adjusted annually on January 1 of each year based on the change in the Consumer Price Index from November 1 through October 31 of the preceding year.
Hired before November 1, 2011	Such annual adjustment cannot exceed 3%.
Hired after October 31, 2011	Such annual adjustment cannot exceed 1%.
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.

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