

Elected Officials' Retirement System of the City of Baltimore

Actuarial Valuation Report as of June 30, 2019

Produced by Cheiron

November 2019

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November 5, 2019

Board of Trustees
Elected Officials' Retirement System of
The City of Baltimore
7 East Redwood Street, 12th Floor
Baltimore, Maryland 21202-3470

Dear Members of the Board:

We are pleased to submit the June 30, 2019 actuarial valuation of the Elected Officials' Retirement System of the City of Baltimore. This report contains information on System assets, liabilities, and contributions. Financial disclosures are provided in a separate Governmental Accounting Standards Board (GASB) Statements Nos. 67 and 68 reports.

The purpose of this report is to present the annual actuarial valuation of the Elected Officials' Retirement System of the City of Baltimore. This report is for the use of the Elected Officials' Retirement Board and its auditors in preparing financial reports in accordance with applicable law and accounting requirements.

This report was prepared exclusively for the Elected Officials' Retirement System of the City of Baltimore for the purpose described herein. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

This report and its contents have been prepared in accordance with accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

Sincerely,
Cheiron

A handwritten signature in blue ink that reads "Anu Patel".

Anu Patel, FSA, MAAA, EA
Principal Consulting Actuary

A handwritten signature in blue ink that reads "Matt Deveney".

Matt Deveney, FSA, MAAA, EA
Consulting Actuary

cc: Kenneth A. Kent, FSA, FCA, MAAA, EA

ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019

FOREWORD

Cheiron is pleased to provide the annual actuarial valuation report of the **Elected Officials' Retirement System of the City of Baltimore** as of June 30, 2019. The purpose of this report is to:

- 1) **measure and disclose**, as of the valuation date, the financial condition of the System,
- 2) **report** on past and expected financial trends,
- 3) **determine** the recommended contributions for FYE 2021, and
- 4) **provide specific information** and documentation required by the City and the auditors of the System.

An actuarial valuation establishes and analyzes System assets and liabilities on a consistent basis, and traces the progress of both from one year to the next. It includes measurement of the System's investment performance as well as an analysis of actuarial liability gains and losses. This valuation report is organized as follows:

Section I presents a summary of the valuation and compares this year's results to last year's results.

Section II identifies the primary risks to the System as well as provides background information and assessment of these risks.

Section III contains exhibits relating to the valuation of assets.

Section IV shows the measure of liabilities and develops the City's required contributions.

The appendices to this report contain a summary of the System's membership at the valuation date, a summary of the major provisions of the System, and the actuarial methods and assumptions used in the valuation.

In preparing our report, we relied on information (some oral and some written) supplied by the Retirement System's Office. This information includes, but is not limited to, the Plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standards of Practice No. 23.

The actuarial assumptions reflect our understanding of the likely future experience of the System, and the assumptions as a whole represent our best estimate for the future experience of the System. The results of this report are dependent upon future experience conforming to these assumptions. To the extent that future experience deviates from the actuarial assumptions, the true cost of the Plan could vary from our results.

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION I – SUMMARY

The actuarial assumptions used in this report have been updated to reflect the new assumptions adopted by the Retirement Board based on the experience study as presented in June 2019. Additionally, the Regular Interest rate decreased from 7.00% to 6.75% based on the City's Retirement code.

The key results of the June 30, 2019 actuarial valuation are as follows:

- Investments earned 3.98% on a market value basis, compared to the assumed rate for the year ending June 30, 2019 of 7.00%.
- The City's funding obligation is based on an actuarial asset value developed in Section III that smooths the volatility of investment returns. The investment return on an actuarial valuation basis was 5.97%. Therefore, there was a net asset loss compared to the 7.00% expected return of \$261,273.
- The recommended total lump sum contribution continues to remain at \$0 for FYE 2020 and FYE 2021 as the Plan remains in a surplus position. The actuarial asset value was greater than the actuarial liability by \$9.1 million, and the amortization of the surplus is greater than the normal cost of the Plan resulting in a contribution of \$0.
- The Plan's surplus decreased from \$10,471,827 as of June 30, 2018 to \$9,139,349 as of June 30, 2019 due to an unfavorable investment return for the year and increase in liabilities due to assumption changes.
- The actuarial liability increased by \$841,216 due to the following actuarial assumption changes reflected in this valuation:
 - Regular interest rate as defined in the code was reduced from 7.00% to 6.75%
 - Post retirement mortality tables were updated to the Pub-2010 General Retiree Below-Median Weighted table with projections for improvement
- Due to the relatively small membership subject to elected terms, the valuation results are expected to exhibit material volatility from year to year. The Plan experienced shifts in the population from 2018 to 2019 due to one non-vested termination and the death of one beneficiary.
- The funded ratio of actuarial asset value to actuarial liability decreased from 168.6% to 153.8% primarily due to lower than expected investment returns and assumption changes. Any surplus assets are used to offset the normal cost of benefits earned during the year. The funded ratio based on Market Value of Assets decreased from 171.7% to 153.6%.

ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION I – SUMMARY

The table below provides details on the development of the FYE 2020 and FYE 2021 contribution results, unfunded actuarial liabilities, and statistics on Plan membership.

Table I-1				
Valuation Summary				
	2018 Valuation		2019 Valuation	
	<u>Applies to FYE 2020</u>		<u>Applies to FYE 2021</u>	
Contributions	Amount	% of Pay	Amount	% of Pay
Normal Cost (Excluding Expenses)	\$ 249,267	17.82%	\$ 275,292	20.20%
Amortization of Unfunded Actuarial Liability	(1,502,134)	-107.39%	(1,419,907)	-104.21%
Interest to Beginning of Next FY	<u>(87,701)</u>	-6.27%	<u>(77,262)</u>	-5.67%
Total Lump Sum Cost	\$ 0	0.00%	\$ 0	0.00%
Total Considered Payroll	\$ 1,398,738		\$ 1,362,517	
Unfunded Liabilities				
Actuarial Liability (AL)				
Active	\$ 2,926,955		\$ 4,249,699	
Terminated Vested	0		0	
Retirees and Dependents	<u>12,334,030</u>		<u>12,751,513</u>	
Total	\$ 15,260,985		\$ 17,001,212	
Less: Actuarial Value of Assets (AVA)	\$ 25,732,812		\$ 26,140,561	
Unfunded Actuarial Liability	\$ (10,471,827)		\$ (9,139,349)	
Funded Ratio based on Actuarial Assets	168.6%		153.8%	
Funded Ratio based on Market Assets	171.7%		153.6%	

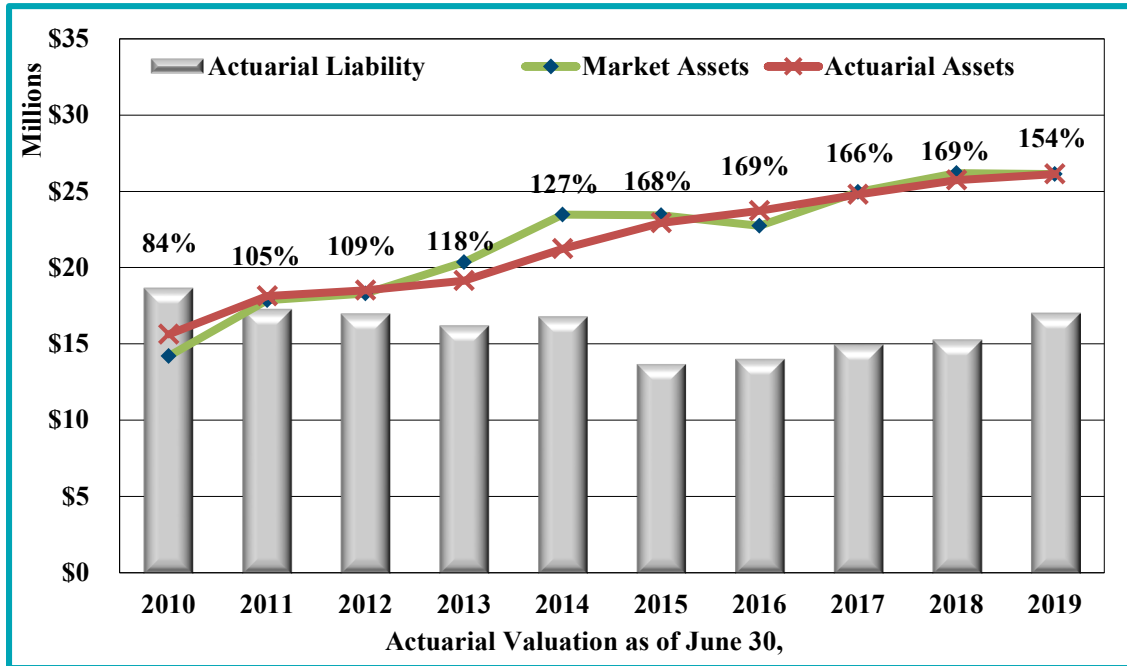
ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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SECTION I – SUMMARY

Historical Trends

It is important to take a step back from these latest results and view them in the context of the System's recent history. Below, we present a series of charts which display key factors in the valuations of the last 10 years.

Assets and Liabilities



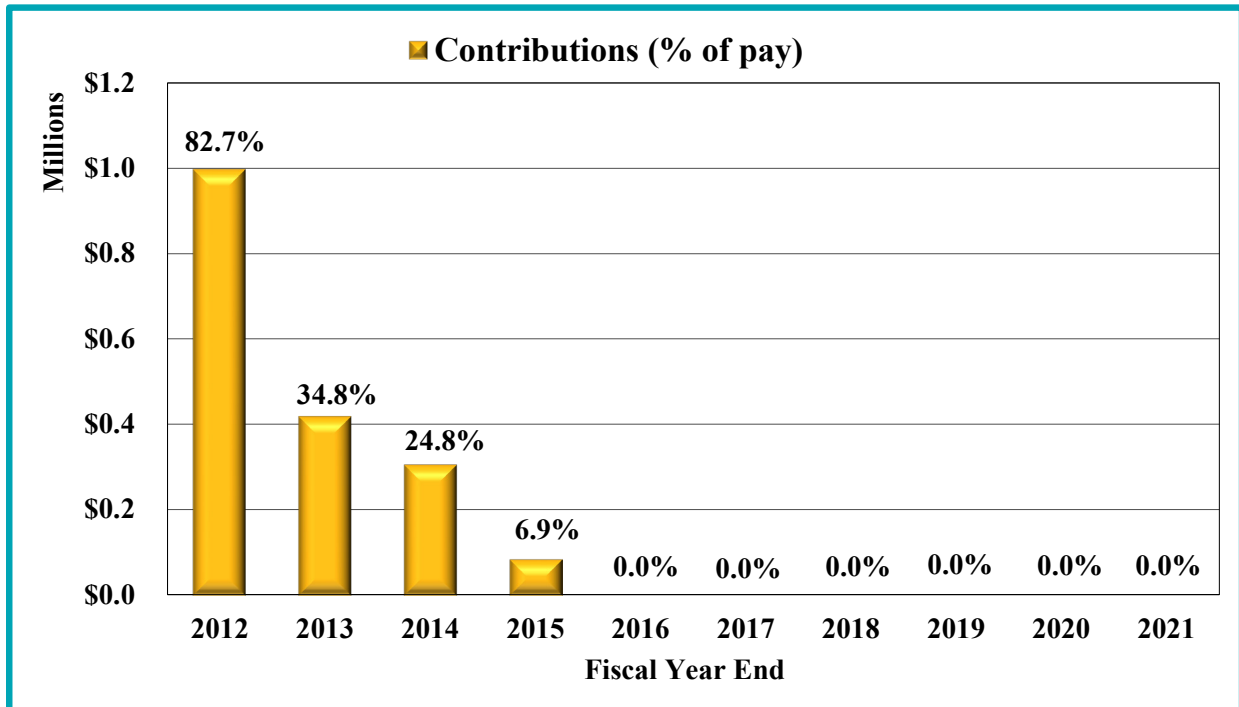
The bars represent actuarial liability and the lines represent the asset values. We compare the actuarial asset value to the actuarial liability in developing the funded percentage. These are the percentages shown in the graph labels. The funded ratio continued to grow over the period from 2010 to 2016, when the System had its highest funded percentage at 169% as of June 30, 2016. The funded ratio increased from 127% to 168% in 2015 primarily because of a decrease in liabilities due to assumption changes. For the current measurement period there was a decrease from 168.6% to 153.8% primarily due to the lower than expected investment return in conjunction with the increase in liabilities as a result of the assumption changes. On a market value basis, the funded percentage during 2019 decreased from 171.7% to 153.6%.

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION I – SUMMARY

Contribution Rates

This graph shows the actuarially calculated City contribution rate, denominated in dollars and as a percent of payroll. The volatility in cost is a function of a plan covering a small number of participants, subject to election and appointment as well as a reflection of investment experience.



The City's contribution requirement remains at \$0 for FYE 2021 due to the surplus position of the Plan.

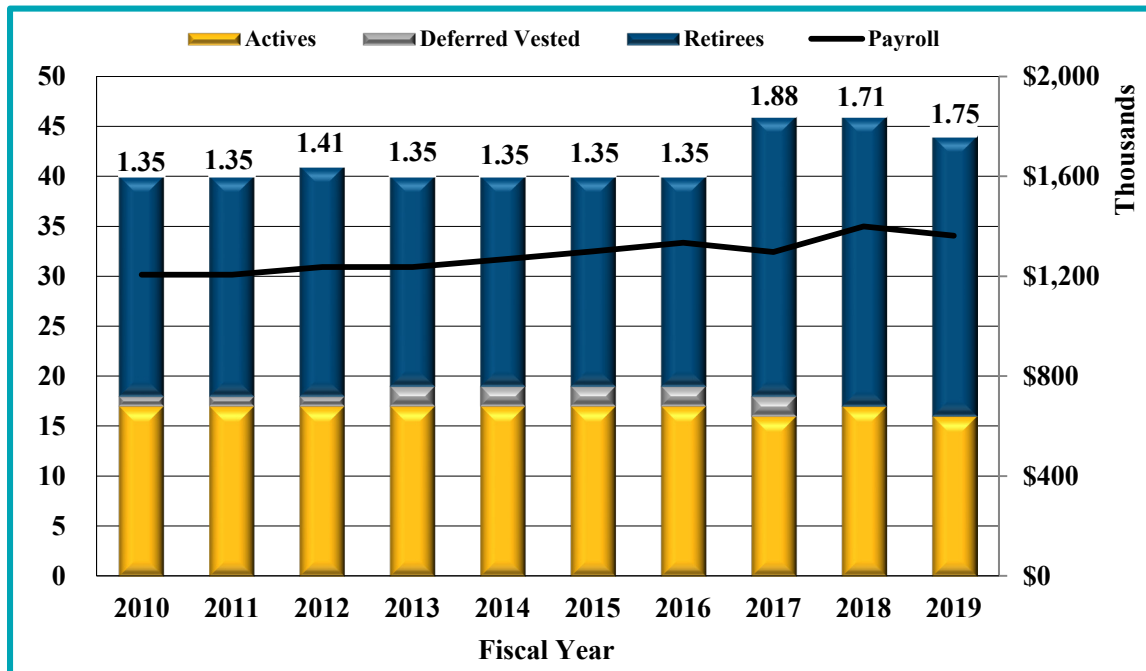
ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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SECTION I – SUMMARY

Participant Trends

This chart shows the number of actives and non-actives covered by the Plan over the past 10-year period using the left hand scale. The numbers which appear above each bar represent the ratio of the number of inactive members to active members at each valuation date. In FYE 2019, the ratio increased due to an active to non-vested termination. The implications of this ratio are related to the cost of the Plan as a percent of active participant payroll. If the Plan becomes underfunded, the future costs are measured as a percent of active payroll, while the asset loss is attributable to all assets including those assets supporting retired lives. Therefore, an increase in cost as a percent of payroll can be more volatile as the ratio of inactive to active participants grows greater than 1 as shown in this graph.

The solid black line goes with the scale on the right, and it shows the total payroll of the active participants during this period.



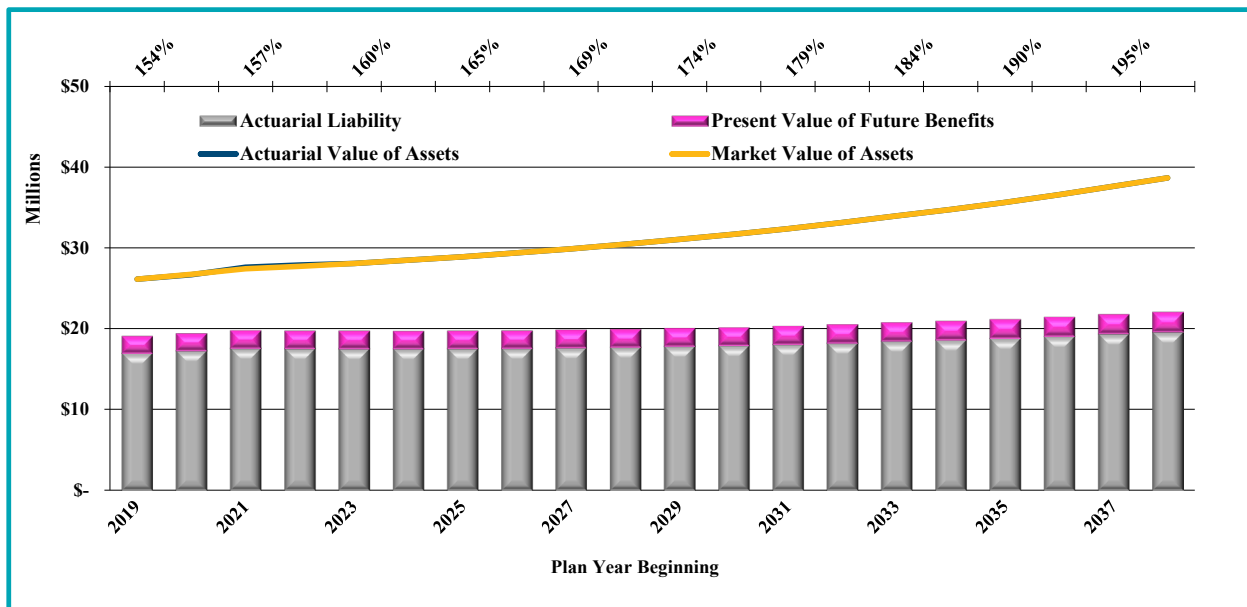
ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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SECTION I – SUMMARY

Future Outlook

Base Line Projections

The chart below shows the expected progress of the System's funded status over the next 20 years. The chart compares assets and liabilities and shows that if all actuarial assumptions are met, the Plan is expected to remain fully funded. The projections reflect expected investment returns of 6.75% each year. The funding percentage continues to increase fully covering the annual cost of benefits as they are projected to be earned. These projections are highly dependent on future investment returns and salary increases. The funded ratio is based on the actuarial assets divided by the actuarial liabilities. The graph also shows the present value of benefits which is a measure of all the benefits, past and future, that are expected to be earned by the current participants.



Given that the Plan is expected to be fully funded if all actuarial assumptions are met, the City's contribution rate will remain at 0% due to surplus (assets are greater than liabilities) throughout the projection period.

While this chart demonstrates that the projected future funded status remains above 100% and based on this the projected future cost is expected to be zero, as mentioned earlier, because the Plan covers a relatively small number of participants, these results could vary widely on a projected basis from year to year.

SECTION II – IDENTIFICATION AND ASSESMENT OF RISK

Introduction

Actuarial Standard of Practice (ASOP) No. 51 was issued by the Actuarial Standards Board to provide guidance to actuaries on the assessment and disclosure of risks related to the possibility that future pension plan experience will deviate from assumptions. This standard does not introduce new concepts to actuarial work; it simply attempts to provide some codification of the practice. Our reports have routinely included stress testing of the valuation results showing the impact of future experience deviating from the underlying assumptions as well as other communications related to the risks that the actual condition of the System will deviate from our valuation results. However, with this ASOP becoming effective for the June 30, 2019 valuation, we have taken this as an opportunity to consolidate the information regarding assessment and disclosure of the System's risks in this section as well as add a number of additional items helping to communicate and understand these risks.

Actuarial valuations are based on a set of assumptions about future economic and demographic experience. These assumptions represent a reasonable estimate of future experience, but actual future experience will undoubtedly be different and may be significantly different. This section of the report is intended to identify the primary risks to the System, provide some background information about those risks, and provide an assessment of those risks.

Identification of Risks

As we have discussed with the Board, the fundamental risk to the System is that the contributions needed to pay the benefits become unaffordable. While there are a number of factors that could lead to contribution amounts becoming unaffordable, we believe the primary risks are:

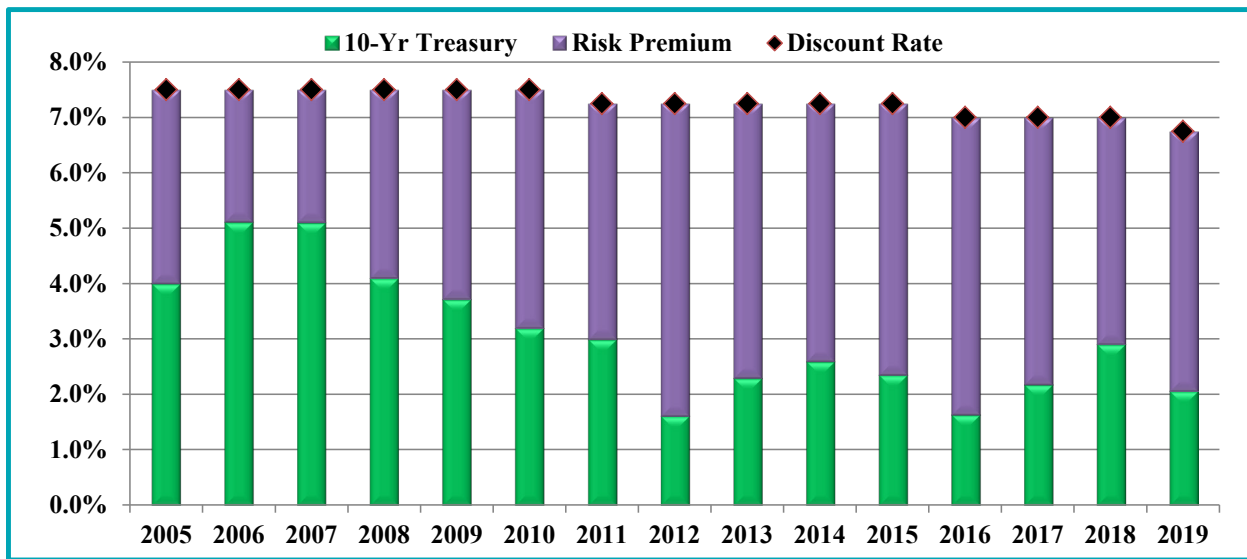
- Investment risk,
- Interest rate risk,
- Longevity and other demographic risks; and
- Assumption change risk.

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SECTION II – IDENTIFICATION AND ASSESMENT OF RISK

Investment Risk is the potential for investment returns to be different than expected. Lower investment returns than anticipated will increase the Unfunded Actuarial Liability necessitating higher contributions in the future unless there are other gains that offset these investment losses. The potential volatility of future investment returns is determined by the System's asset allocation and the affordability of the investment risk is determined by the amount of assets invested relative to the size of the plan sponsor or other contribution base.

Interest Rate Risk is the potential for interest rates to be different than expected. For public plans, short term fluctuations in interest rates have little or no effect as the system's liability is usually measured based on the expected return on assets. Longer-term trends in interest rates however can have a powerful effect. The chart below shows the yield on a 10-year Treasury security compared to the System's assumed rate of return. The difference is a simple measure of the amount of investment risk taken. As interest rates have declined, plans face a choice: maintain the same level of risk and reduce the expected rate of return; maintain the same expected rate of return and take on more investment risk; or some combination of the two strategies. The System has reduced their discount rate from 7.50% to 6.75% over the period shown.



Longevity and Other Demographic Risks are the potential for mortality or other demographic experience to be different than expected. Generally, longevity and other demographic risks emerge slowly over time. Due to the relatively small membership subject to elected terms, the demographic experience is expected to exhibit material volatility from year to year.

Assumption Change Risk is the potential for the environment to change such that future valuation assumptions are different from the current assumptions. For example, declines in interest rates over time may result in a change in the assumed rates of return used in the valuation. A healthier workforce may result in changes in employee behavior such that retirement rates are adjusted to reflect employees working longer. Assumption change risk is an extension of the other risks identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in environment when the current assumption is no longer reasonable.

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SECTION II – IDENTIFICATION AND ASSESMENT OF RISK

In understanding the impact of some of these risks, it is useful to look at past experience deviations. These deviations are commonly referred to as actuarial gains and losses. The chart below shows the components of changes in the Unfunded Actuarial Liability (UAL) for the System over the last ten years, including investment gains and losses on the Actuarial Value of Assets, liability gains and losses, assumption and method changes, and the paying down of the UAL. Amounts below the horizontal axis are gains, or decreases to the UAL, while amounts above the axis are losses, or increases to the UAL. The net UAL change is shown by the dark blue line. Table II-1 below the chart summarizes the changes in the UAL over the last ten years.

Historical Changes in UAL 2010-2019

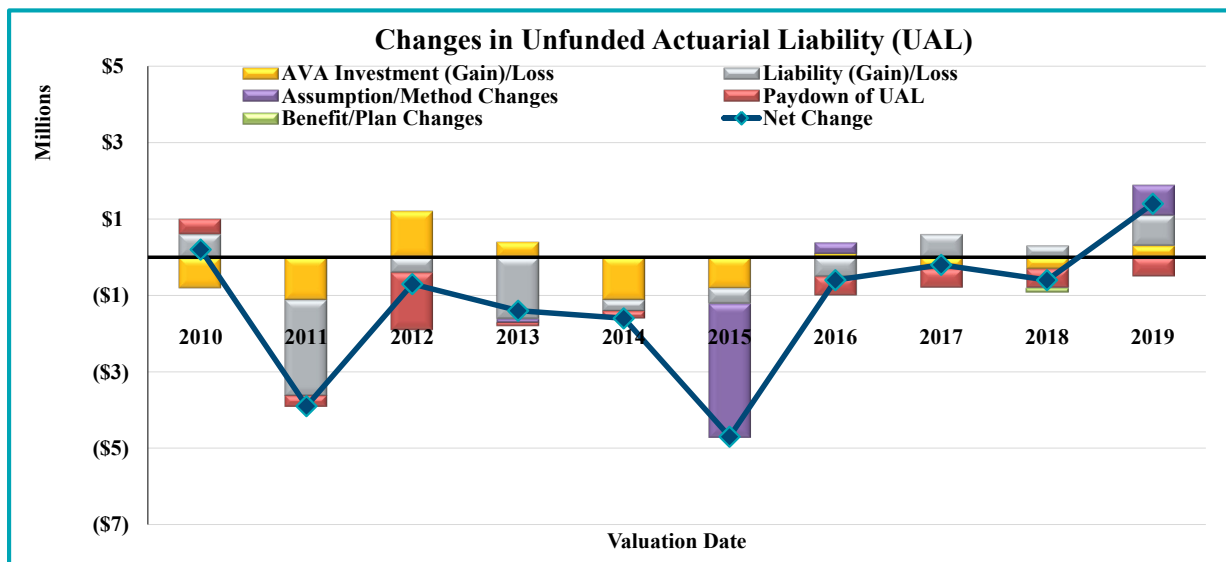


Table II-1 Changes in Unfunded Actuarial Liability (UAL) (\$ millions)											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Discount Rate	7.50%	7.25%	7.25%	7.25%	7.25%	7.25%	7.00%	7.00%	7.00%	6.75%	
Source											
AVA Investment (G)/L	\$ (0.8)	\$ (1.1)	\$ 1.2	\$ 0.4	\$ (1.1)	\$ (0.8)	\$ 0.1	\$ (0.3)	\$ (0.3)	\$ 0.3	\$ (2.4)
Liability (G)/L	0.6	(2.5)	(0.4)	(1.6)	(0.3)	(0.4)	(0.5)	0.6	0.3	0.8	(3.4)
Assumption/Method Changes	0.0	0.0	0.0	(0.1)	0.0	(3.5)	0.3	0.0	0.0	0.8	(2.5)
Benefit/Plan Changes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(0.1)	0.0	(0.1)
Paydown of UAL ¹	0.4	(0.3)	(1.5)	(0.1)	(0.2)	0.0	(0.5)	(0.5)	(0.5)	(0.5)	(3.7)
Total UAL Change	0.2	(3.9)	(0.7)	(1.4)	(1.6)	(4.7)	(0.6)	(0.2)	(0.6)	1.4	\$ (12.1)

¹ UAL change due to benefit accruals and payments, contributions, timing, and interest.

On a smoothed asset basis, the investment gains and losses (gold bars) from 2010 to 2019 spread gains and losses over the five successive years. Over the ten-year period, investment gains and losses, have reduced the UAL approximately \$2.4 million.

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SECTION II – IDENTIFICATION AND ASSESMENT OF RISK

On the liability side (gray bars), the System has experienced offsetting gains and losses, decreasing the UAL by approximately \$3.4 million over the ten-year period.

Assumption and method changes (purple bars) have decreased the UAL by approximately \$2.5 million over the ten-year period. The method changes have included changing the funding method from projected unit credit to entry age normal in 2012. The significant assumption changes have included decreases to the salary and post retirement increase assumptions along with an update to the mortality table in 2015, reductions in the discount rate from 7.25% (in 2011) to 7.00% (in 2016) to the current 6.75% (in 2019), and experience studies in 2015 and 2019.

A plan change (green bars) in 2018 decreased the UAL by approximately \$0.1 million.

Each year the UAL is expected to decrease as the System contributes towards the UAL, assuming no future investment and liability gains and losses. The System has been fully funded since 2011, resulting in a negative UAL and no contributions have been required by the City since 2016. Net changes due to paying down the UAL (red bars), which reflects benefit accruals and payments, contributions, and timing, have decreased the UAL by approximately \$3.7 million over the last ten years.

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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SECTION II – IDENTIFICATION AND ASSESMENT OF RISK

Plan Maturity Measures

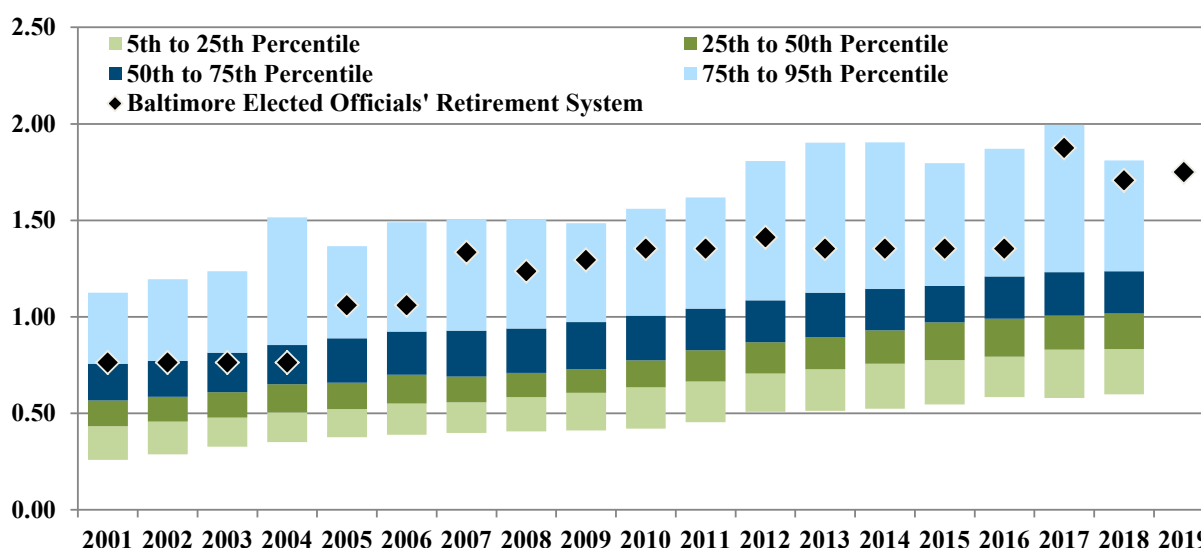
The future financial condition of a mature pension plan is more sensitive to each of the risks identified above than a less mature plan. Before assessing each of these risks, it is important to understand the maturity of this System compared to other plans and how the maturity has changed over time.

Plan maturity can be measured in a variety of ways, but they all get at one basic dynamic - the larger the plan is compared to the contribution or revenue base that supports it, the more sensitive the plan will be to risk. The measures below have been selected as the most important in understanding the primary risks identified for this System.

Inactives per Active (Support Ratio)

One simple measure of plan maturity is the ratio of the number of inactive members (those receiving benefits or entitled to a deferred benefit) to the number of active members. The revenue base supporting the plan is usually proportional to the number of active members, so a relatively high number of inactives compared to actives indicate a larger plan relative to its revenue base as well.

Support Ratio - Inactives per Active



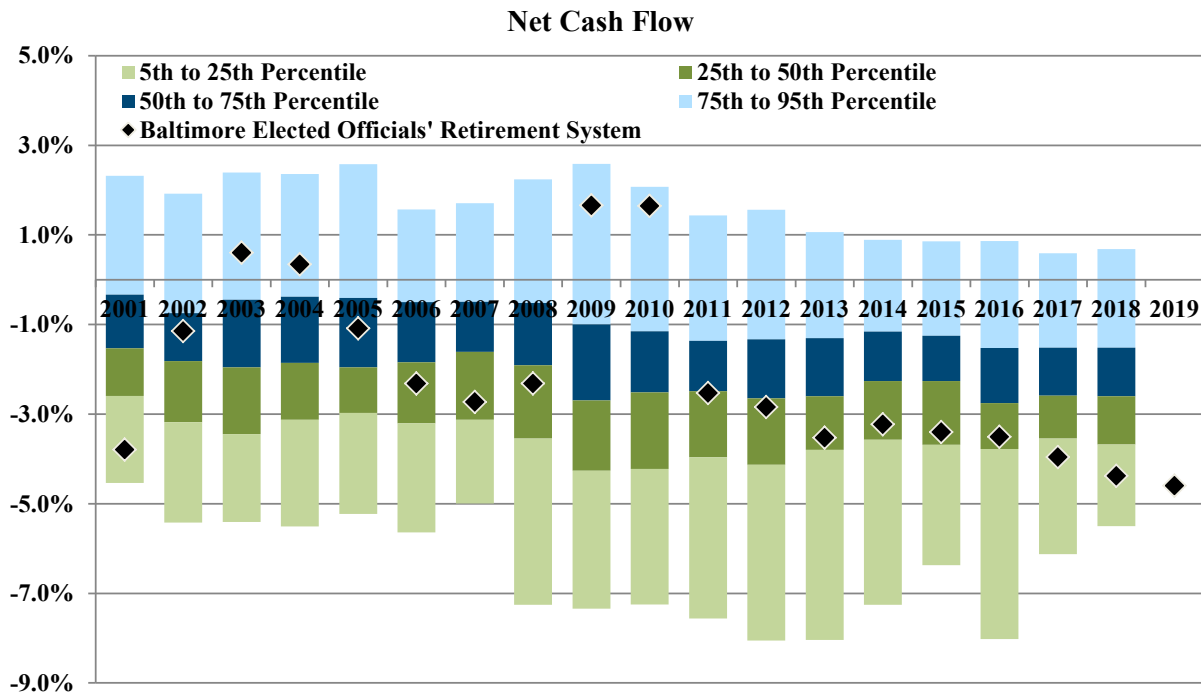
The Boston College's Center for Retirement Research, NASRA and the Center for State and Local Government Excellence maintain the Public Plan Database that contains the majority of state plans as well as many large municipal plans. The graph above shows the distribution from the 5th to 95th percentile of support ratios for the plans in the Public Plans Database. The black diamond shows how the System compares to the other plans. The System was already in a relatively mature status in 2005 being in the 75th to 95th percentile. While the System's support ratio has gradually increased over time, the support ratios for the plans as a whole have also increased over the period as they mature. As a relatively small membership subject to elected terms, the System's support ratio is expected to exhibit material volatility from year to year.

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SECTION II – IDENTIFICATION AND ASSESMENT OF RISK

Net Cash Flow Ratio

The net cash flow of the plan as a percentage of the beginning of year assets indicates the sensitivity of the plan to short-term investment returns. Net cash flow is equal to contributions less benefit payments and administrative expenses. Mature plans can have large amounts of benefit payments compared to contributions, particularly if they are well funded. Investment losses in the short-term are compounded by the net withdrawal from the plan leaving a smaller asset base to try to recover from the investment losses. Large negative cash flows can also create liquidity issues.



The graph above shows the distribution from the 5th to 95th percentile of net cash flow as a percent of assets for the plans in the Public Plans Database. The black diamond shows how the System compares to the other plans. Since 2011, the System's cash flow as a percent of assets has consistently been amongst the 5th to 50th percentile. The decrease in this percent is primarily due to the decrease in contributions over the study period. Because the System is overfunded employer contributions have decreased since 2010 all the way down to \$0 since 2016 resulting in a negative cash flow. The contributions are expected to remain \$0 through 2021 as a result of the funded status being over 100% and the amortization of the surplus covering the normal cost each year.

SECTION II – IDENTIFICATION AND ASSESMENT OF RISK

Deterministic Scenarios/Stress Testing

Assessing the future risk that the expected measurements produced by the actuarial valuations will deviate from the actual values over time is complex and can never be exactly known.

In the Summary section of this report we show a baseline projection of funded status and projected costs assuming a 6.75% investment return assumption per year. It is important to note that baseline projections, while valid, **are not going to occur** as experience never conforms exactly to assumptions every year. Therefore, we have developed hypothetical scenarios to illustrate the impact deviations from assumed investment returns may have on future funded status and contribution rates. The scenarios are balanced between positive and negative scenarios and are intended to illustrate the importance of both the return itself as well as the timing of such returns.

The graphs on the following page show the projections under each of these theoretical scenarios: optimistic returns of 8.75% per year and pessimistic returns of 4.75% per year.

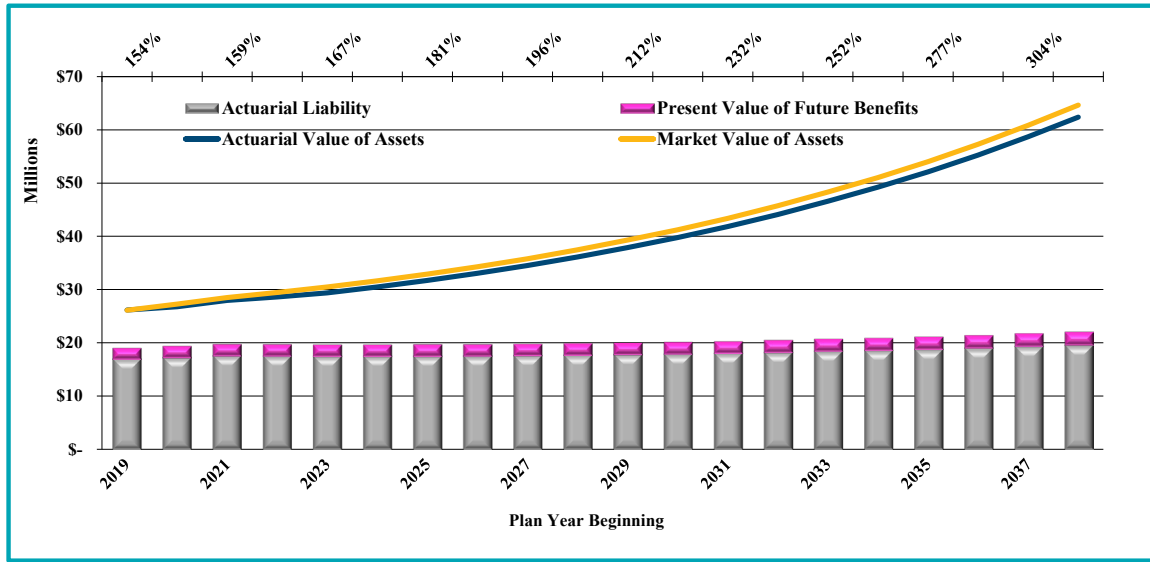
For each scenario, the projection chart compares the market value of assets (MVA) (gold line) and the actuarial or smoothed value of assets (AVA) (blue line) to the Plan's actuarial liabilities (AL) (gray bars). In addition, at the top of each chart, we show the Plan's AVA funded ratio (ratio of AVA to AL). The years shown in the chart signify the valuation date as of June 30 of the labeled year.

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SECTION II – IDENTIFICATION AND ASSESMENT OF RISK

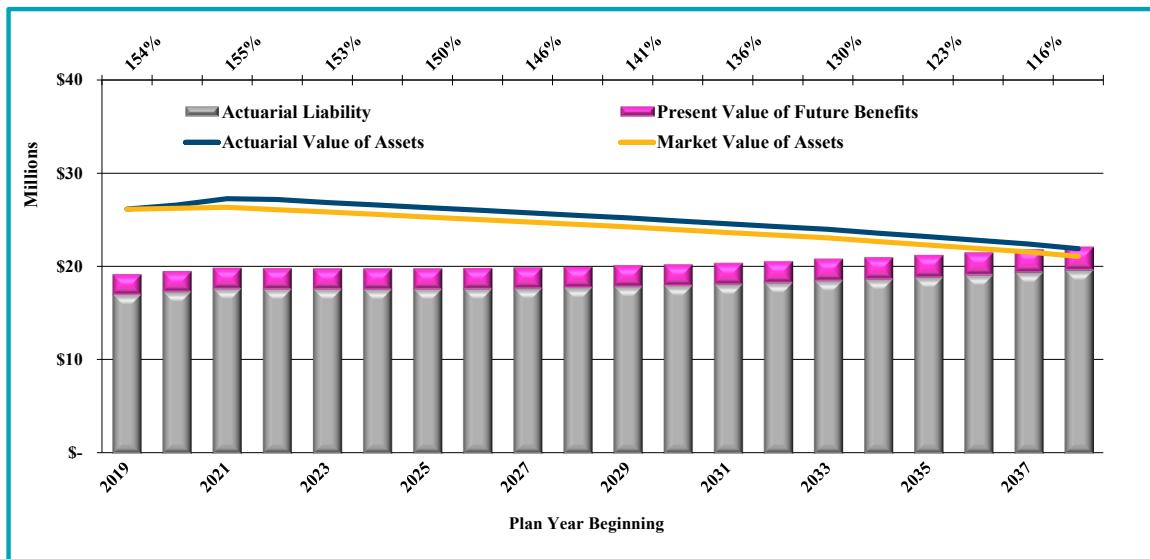
Optimistic Returns of 8.75%

If the System earns 2.00% greater than the assumed rate of return in each year of the projection, the AVA funded ratio is projected to increase to 200% by the 2028 valuation, eleven years earlier than in the baseline projection. Given the System is expected to be in a surplus position, no employer contributions would be required for the projection period under this scenario.



Pessimistic Returns of 4.75%

If the System earns 2.00% less than the assumed rate of return in each year of the projection, the AVA funded ratio declines over the next 20 years but is still expected to remain above 100% through 2038. Given the System is expected to be in a surplus position, no employer contributions would be required for the projection period under this scenario.



**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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SECTION III – ASSETS

The statement of assets below is based on unaudited financial data furnished by the Retirement System's Office. The change in market value of assets during the valuation year ending June 30, 2019 is summarized below.

**Table III-1
Market Value of Assets as of June 30, 2019**

	<u>Market Value</u>
Fund Balance on June 30, 2018	\$ 26,197,456
Contributions	
Member	\$ 70,259
City/State	<u>0</u>
Total Contributions	\$ 70,259
Investment Income	
Interest, Dividends, and Realized Capital Gains	\$ 205,241
Unrealized Gains (Losses)	911,245
Investment Expenses	(60,248)
Administrative Expenses	<u>(36,122)</u>
Net Investment Income	\$ 1,020,116
Payments of Benefits & Refunds	(1,165,567)
Fund Balance on June 30, 2019	\$ 26,122,264

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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SECTION III – ASSETS

This next table shows the calculation of investment gains and losses and application of the asset smoothing method to arrive at the actuarial asset value. The System's investment experience was less than expected, resulting in a 3.98% return, which in turn resulted in an investment loss of \$776,019 during FYE 2018-2019. This loss is spread over a five-year period and recognized in the actuarial value of assets until it is fully recognized. The absolute value of the total unrecognized gain/loss is limited by a corridor of not more or less than 10% of the market value of assets. This corridor does not apply for the 2019 Plan Year.

Table III-2 Development of Actuarial Value of Assets				
				<u>June 30, 2019</u>
Investment Gain (Loss)				
1. Beginning of year market value of assets				\$ 26,197,456
2. Net cash flow				(1,095,308)
3. Actual investment earnings during FY				1,020,116
4. Anticipated earnings at 7.00% per annum during FY				<u>1,796,135</u>
5. Investment Gain/(Loss) (3. - 4.)				\$ (776,019)
Recognized and Unrecognized Gain/(Loss)				
Valuation	Investment	Percent	Recognized as of	Unrecognized as of
<u>Year</u>	<u>Gain/(Loss)</u>	<u>Recognized</u>	<u>June 30, 2019</u>	<u>June 30, 2019</u>
2015	\$ (1,083,024)	100%	\$ (1,083,024)	\$ 0
2016	(1,664,592)	80%	(1,331,674)	(332,918)
2017	1,497,561	60%	898,537	599,024
2018	560,686	40%	224,274	336,412
2019	(776,019)	20%	(155,204)	<u>(620,815)</u>
				\$ (18,297)
			Maximum of 10% of assets at June 30, 2019	\$ 2,612,226
Actuarial Value of Assets				<u>June 30, 2019</u>
1. Market value as of June 30, 2019				\$ 26,122,264
2. Investment (Gain)/Loss not yet recognized				<u>18,297</u>
3. Actuarial value of assets				\$ 26,140,561
4. Ratio of actuarial asset value to market asset value				100.07%

ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION IV – LIABILITIES AND CONTRIBUTIONS

The table below discloses the actuarial liabilities by membership status and compares them to the actuarial value of assets to define the unfunded actuarial liability. The liabilities are for funding purposes and are not appropriate for measuring the cost of settling System's liabilities by purchasing annuities or paying lump sums. The overfunded amount is amortized over an eight-year period and that amount is then subtracted from the Normal Cost (cost to cover the upcoming year's expected accruals less member contributions) to produce the recommended employer contributions. Because of the size of this year's surplus, this amount fully offsets the normal cost.

Table IV-1		
Valuation Summary		
	<u>As of June 30, 2018</u>	<u>As of June 30, 2019</u>
Number of Participants		
Active	17	16
Terminated vested	0	0
Retired	29	28
Total Participants	46	44
Annual compensation of active participants	\$ 1,398,738	\$ 1,362,517
Average compensation of active participants	\$ 82,279	\$ 85,157
Average Age	49.95	49.81
Average Service (not including service to be purchased)	8.49	10.32
Development of Unfunded Actuarial Liability		
1. Actuarial Liability		
Active	\$ 2,926,955	\$ 4,249,699
Terminated vested	0	0
Retirees and dependents	12,334,030	12,751,513
Total	\$ 15,260,985	\$ 17,001,212
2. Actuarial value of assets	25,732,812	26,140,561
3. Unfunded actuarial liability (1. - 2.)	\$ (10,471,827)	\$ (9,139,349)
4. 9-year amortization payment at 7.00% for 2018 8-year amortization payment at 6.75% for 2019	\$ (1,502,134)	\$ (1,419,907)
5. Normal Cost (excluding expenses)	249,267	275,292
6. Interest on (4.) and (5.) to beginning of next FY	(87,701)	(77,262)
7. Total City Contribution if paid at beginning of next FY (4. + 5. + 6.), but not less than zero	\$ 0	\$ 0

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION IV – LIABILITIES AND CONTRIBUTIONS

This next table presents the change in actuarial liabilities during the plan year. In general, the actuarial liability of any retirement system is expected to change at each subsequent valuation for a variety of reasons including:

- New hires since the last valuation
- Benefits accrued since the last valuation
- Plan amendments
- Interest on liabilities
- Benefits paid to retirees
- Participants leaving employment at rates different than expected
- Changes in actuarial assumptions
- Changes in actuarial methods
- Corrections to participant data records

The following table summarizes how these various elements have impacted the value of liabilities from last year to this year.

Table IV-2 Changes in Liabilities		
Actuarial Liability at June 30, 2018	\$	15,260,985
Actuarial Liability at June 30, 2019	\$	17,001,212
Liability Increase/(Decrease)		1,740,227
Change due to:		
Accrual of Benefits	\$	249,267
Benefit Payments		(1,165,567)
Passage of Time (Interest)		1,045,613
Plan Amendment		0
Actuarial Assumption Change		841,216
Actuarial (Gain)/Loss		769,698
Total Change	\$	<u>1,740,227</u>

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION IV – LIABILITIES AND CONTRIBUTIONS

The table below provides the components of the liability loss developed in the previous table.

Table IV-3	
Elements of Actuarial Liability - Gain/(Loss)	
1. Age and Service Retirements - Gain/(Loss)	\$ 0
2. Disability Retirements - Gain/(Loss)	2,063
3. Death in Service Benefits - Gain/(Loss)	0
4. Withdrawal from Employment - Gain/(Loss)	41,992
5. Pay Increases - Gain/(Loss)	(619,898)
6. Death after Retirement - Gain/(Loss)	42,244
7. New Entrants - Gain/(Loss)	0
8. Other - Gain/(Loss)	<u>(236,099)</u>
9. Actuarial Liability - Gain/(Loss) (sum 1-8)	\$ <u>(769,698)</u>
10. Assumption Changes - Gain/(Loss)	(841,216)
11. Plan Changes - Gain/(Loss)	<u>0</u>
12. Total Actuarial Liability - Gain/(Loss) (sum 9-11)	\$ <u>(1,610,914)</u>

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX A – PLAN MEMBERSHIP

The data for this valuation was provided electronically by the Retirement System Office. Cheiron did not audit the data. However, the data was reviewed to ensure that it complies with generally accepted actuarial standards. The data for active and inactive participants is as of June 30, 2019. Where data elements were missing, date of hire, date of birth, and benefit accrual level assumptions were made to fill in the blanks. The assumptions made on missing data, if any, are included in Appendix B.

The tables below contain a summary of the data provided as of June 30, 2019 and a reconciliation of the data from the prior to current year.

Member Statistics			
	<u>June 30, 2018</u>		<u>June 30, 2019</u>
Actives			
Count	17		16
Average Age	50.0		49.8
Average Service	8.5		10.3
Average Payroll	\$	82,279	\$ 85,157
Deferred Vested			
Count	0		0
Average Age	0		0
Average Annual Benefit	\$	0	\$ 0
Inactive			
Count	29		28
Average Age	70.3		70.5
Average Annual Benefit	\$	39,320	\$ 40,006

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX A – PLAN MEMBERSHIP

Reconciliation of all EOS Members					
	<u>Active</u>	<u>TV</u>	<u>Retired</u>	<u>Disabled</u>	<u>Total</u>
1. Membership as of June 30, 2018	17	0	28	1	46
2. New Entrants	0	0	0	0	0
3. Retired	0	0	0	0	0
4. Disabled	0	0	0	0	0
5. Terminated Vested	0	0	0	0	0
6. Terminated Non-Vested	(1)	0	0	0	(1)
7. Transfer to ERS	0	0	0	0	0
8. Stopped Payment	0	0	0	0	0
9. Died	0	0	(1)	0	(1)
10. Beneficiary	0	0	0	0	0
11. Rehired	0	0	0	0	0
12. Data Correction	0	0	0	0	0
13. Membership as of June 30, 2019	16	0	27	1	44
Current Annual Payroll	\$ 1,362,517				
Expected Annual Benefit Payments	\$ 1,106,947				

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

1. Actuarial Cost Method

Method of Funding: Entry Age Normal Cost Method was approved by the Board of Trustees effective date of 7/1/2013.

Amortization Period: The unfunded actuarial liability, including actuarial gains and losses, is amortized as a level dollar over 16 years beginning June 30, 2011. The 16-year period is decreased each year. As of June 30, 2019, the unfunded liability is amortized over 8 years.

Asset Valuation: The actuarial value of assets is equal to market value plus accrued contributions minus/plus the unrecognized gain/loss as of the valuation date. Each year's gain/loss is recognized over five years. Investment gains/losses are defined as earnings in excess of expected earnings (7.00% for FYE 2019 and 6.75% for FYE 2020) of the market asset value at the beginning of the year.

The absolute value of the total unrecognized gain/loss is limited to not more or less than 10% of the market value of assets.

2. Actuarial Assumptions

All actuarial assumptions are subject to Board of Trustees' approval, with changes typically addressed following each five-year experience study and following the recommendation of the actuary. An experience study was performed in 2019 based on 2014 through 2018 experience analysis. The rationale for the actuarial assumptions is provided within the experience study report.

Investment Return: 6.75% compounded annually, net of all expenses. This assumption is defined by City Code based on the definition of *Regular Interest*, which has been amended from time to time based on the advice of the actuary and investment consultant and recommendation of the Board of Trustees in the form of an amendment to the City Code from time to time.

Salary Increases: 2.5% compounded annually based on our understanding of the compensation capped growth rate for Elected Officials.

**Post-Retirement
Increase:**

1. First became a member on or before December 5, 2016:
2.5% compounded annually, with a one year wait period for retirements on or after March 1, 2017.
2. First became a member on or after December 6, 2016:
1.5% until age 65 and 2.0% thereafter, compounded annually, with a one year wait period

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

***Pre-Retirement
Mortality:***

None - given the small covered population and the nature of the pre-retirement death benefits providing return of most or more than the benefit value at death, the best assumption to fit these circumstances is to assume no discount of benefits for pre-retirement mortality.

***Post-Retirement
Mortality:***

1. Retirees and Beneficiaries:

Pub-2010 General Retiree Below-Median Weighted mortality tables adjusted by 115% for males and 125% for females with future mortality improvement through 2022 using SOA's Scale MP-2018.

2. Disabled members:

Pub-2010 General Disabled Annuitant mortality tables adjusted by 163% for males and 145% for females with future mortality improvement through 2022 using SOA's Scale MP-2018.

Age	Retirees and Beneficiaries*		Disabled Members	
	Male	Female	Male	Female
55	0.010045	0.005765	0.033406	0.024785
60	0.012233	0.006648	0.040073	0.028299
65	0.014949	0.008659	0.04931	0.032604
70	0.023702	0.014508	0.062827	0.040508
75	0.038893	0.025035	0.082293	0.055942
80	0.065591	0.044199	0.115647	0.084194

* Rates for individuals who are the age shown as of the valuation date.

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Disability:

AGE	Non-Line- of-Duty Disability	Line-of- Duty Disability
25	0.0008	0.0002
30	0.0008	0.0002
35	0.0012	0.0002
40	0.0023	0.0003
45	0.0035	0.0005
50	0.0057	0.0005
55	0.0080	0.0008
60	0.0013	0.0012
65	0.0014	0.0014
69	0.0015	0.0015

Withdrawal:

None, since future service credit may be purchased.

Retirement Age:

1. Members hired before December 6, 2016:
The later of (i) completion of current term or, (ii) end of term when first eligible for retirement (16 years of service or age 50 with 12 years of service).
2. Members hired on or after December 6, 2016:
The later of (i) completion of current term or, (ii) end of term when first eligible for retirement (age 55 with 12 years of service).

Percentage Married:

Males: 80%; Females: 80%

Age Difference:

A husband is assumed to be four-years older than his wife.

Expenses:

Administration and investment expenses are assumed to be covered by the investment earnings. It is assumed that the Fund will have sufficient earnings to pay these expenses and meet the interest assumption.

Benefit Offsets:

None

Election Year:

The next election year is assumed to occur in 2020. Elections are then assumed to be held every four years thereafter.

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

<i>Employee Contributions:</i>	Employee contributions are assumed to completely cover the cost of the active service retirement annuity and are therefore not included as an offset to the normal cost of the service retirement pension.
<i>Data Assumptions:</i>	There were no data assumptions applied in the preparation of this valuation, as all data for active and nonactive participants was supplied by the Retirement System Office.
<i>Justification for Assumptions:</i>	The actuarial assumptions were adopted by the Retirement Board, based upon the alternatives presented in the 2019 experience study report conducted on the System's experience from the 2014-2018 valuations. The results of this study were presented in 2019 and are incorporated into this report by reference.
<i>Changes Since Last Valuation:</i>	<p>The Regular Interest rate was decreased from 7.00% to 6.75%</p> <p>The post-retirement mortality assumption for retirees and beneficiaries was updated to Pub-2010 General Retiree Below-Median Weighted mortality tables adjusted by 115% for males and 125% for females with future mortality improvement through 2022 using SOA's Scale MP-2018.</p> <p>The post-retirement mortality assumption for disabled members was updated to Pub-2010 General Disabled Annuitant mortality tables adjusted by 163% for males and 145% for females with future mortality improvement through 2022 using SOA's Scale MP-2018.</p>

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

In this section, the basis of the valuation is presented and described. This information – the provisions of the Plan and the census of participants – is the foundation of the valuation, because these are the present facts upon which benefit payments will depend.

The valuation is based upon the premise that the Plan will continue to be in existence, so future events must also be considered. These future events are assumed to occur in accordance with the actuarial assumptions and concern such events as the earnings of the Fund, the number of participants who will remain to retirement, their ages at retirement, and expected benefits.

Effective Date

The Plan was established by City Ordinance 1105 effective December 5, 1983 and has been amended periodically.

Membership

Any elected official who is not a class A, B, C, or D member of the Employees' Retirement System of Baltimore City, upon taking the oath of office, shall automatically become a member of this system.

Any elected official who is a class A, B, C, or D member of the Employees' Retirement System shall have the option, within 120 days of taking the oath of office, to become a member of this retirement system.

Current Annual Earnable Compensation

The current annual Compensation authorized for an elected position, including any future increases occurring after the retirement of the official, which shall, after retirement, index benefits paid under this system subject to applicable reduction for any optional retirement allowance selection.

Retirement Date

1. Service Retirement – Members hired before December 6, 2016 are eligible to retire after the earlier of (1) acquiring at least 16 years of service credit or (2) attaining age 50 with at least 12 years of service credit. Members hired on or after December 6, 2016 are eligible to retire after attaining age 55 with at least 12 years of service credit.
2. Non-Line-of-Duty Disability – A member may retire with a Non-Line-of-Duty Disability pension, if the member has five years of service and is determined to be mentally or physically incapacitated for the further performance of the duties as an elected official and such incapacity is likely to be permanent.
3. Line-of-Duty Disability – A member may retire with a Line-of-Duty Disability pension if the member is totally and permanently incapacitated for the further performance of his / her duties as the result of an accident occurring while in the actual performance of such duties without willful negligence on his / her part.

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Service Retirement Benefit

Upon retirement from service, a member shall be entitled to receive a maximum service retirement allowance which shall consist of:

- An annuity which shall be the actuarial equivalent of accumulated contributions at the time of retirement; and
- A pension, in addition to the annuity, which together shall be equal to 2.5% of the current annual earnable compensation applicable to that office multiplied by the number of years of membership credit; and

For members hired on or after December 6, 2016, the maximum allowance shall not exceed 60% of the member's annual compensation at retirement. The maximum allowance shall be payable in the form of a life annuity with 40% continuing to the unmarried spouse or minor children upon a member's death. There is no reduction in benefit for this annuity form.

Non-Line-of-Duty Disability Retirement Benefit

The greater of:

1. An annuity, which shall be the actuarial equivalent of accumulated contributions at the time of retirement and a pension, which, together with this annuity, shall be equal to the annual amount of accrued service retirement allowance; or
2. A total retirement allowance consisting of 25% of the current annual earnable compensation applicable to that office.

This benefit will be offset by workers' compensation received on account of the same disability.

Line-of-Duty Disability Benefit

1. An annuity which shall be the actuarial equivalent of accumulated contributions at the time of retirement; and
2. A pension, in addition to the annuity, of 66-2/3% of the current annual compensation applicable to that office.

This benefit will be offset by workers' compensation received on account of the same disability.

Non-Line-of-Duty Death Benefit

The beneficiary of a member who dies while serving as an elected official or retires and dies within 30 days of service will receive either:

1. A lump sum equal to 50% of his/her current annual earnable compensation at the time of death plus return of the member's contributions; or
2. If the member was eligible to retire, the beneficiary will receive the 100% Joint and Survivor benefit described in Option 2 (see Optional Retirement Allowances). To receive this death benefit, the beneficiary must be designated to be the spouse who has been married to the participant for at least one year immediately prior to death or a parent.

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

This benefit will be offset by workers' compensation benefits and benefits paid by the System before the date of death.

Line-of-Duty Death Benefit

A pension shall be paid if a hearing examiner determines that a member's death occurred in the actual performance of duty and without willful negligence. The benefit equals a refund of accumulated contributions and interest plus a pension of 100% of the current annual earnable compensation applicable to that office as of the date of death.

This benefit will be offset by workers' compensation benefits.

Optional Retirement Allowances

The benefit will be reduced if a member elects to receive the benefit in one of the following forms:

1. A cash refund annuity providing the lump-sum balance of the reserve at retirement to beneficiary;
2. Joint and Survivor: life annuity with 100% or 50% continuing to beneficiary upon death of the member;
3. Pop-up Joint and Survivor: life annuity with 100% or 50% continuing to beneficiary upon death of the member. If the beneficiary predeceases the member, the member's benefit increases to the pre-reduction amount; or
4. Specific Benefit Option: upon the member's death, the beneficiary will receive either a specific lump sum amount or a specific periodic allowance for life.

Termination of Employment

Members with 12 years of service are vested. For members hired before December 6, 2016 a benefit equal to the Service Retirement Benefit is payable at age 50 if a member does not withdraw his/her contributions. For members hired on or after December 6, 2016 a benefit equal to the Service Retirement Benefit is payable at age 55 if a member does not withdraw his/her contributions.

A member terminating employment may withdraw his/her contributions from the System.

Continued Membership

An elected official, who is a member of this Retirement System, shall have the right at his/her option to continue membership in this Retirement System provided that he/she contributes both City and member contributions.

Member Contributions

Members are required to contribute 5% of salary. However, no contributions shall be made by the member after the member has attained age 60 and has acquired 35 years of service credit in this System.

Member contributions are accumulated at 3.0% interest, per annum effective January 1, 2017.

If a member transfers prior City service (such as ERS service), he/she must pay back the equivalent of such past member contributions.

**ELECTED OFFICIALS' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Retirement Benefit Increases

For members who joined on or before December 5, 2016, benefits are indexed to the current salaries of elected officials. For members who joined on or after December 6, 2017, increases are the greater of 1.5% and the rates in effect for the Fire & Police Retirement System, with a one year wait period.

Members who retire on or after March 1, 2017 will receive the benefit increase beginning in January of the year following the first June 30 as of which the retiree has received benefit payments for at least 12 consecutive months.

Note: The above is only a summary. The provisions of the law will govern the System.