The Maryland-National Capital Park and Planning Commission Employees' Retirement System

Actuarial Valuation as of July 1, 2019

Produced by Cheiron

November 2019

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LETTER OF TRANSMITTAL

November 26, 2019

Board of Trustees
Employees' Retirement System
6611 Kenilworth Avenue, Suite 100
Riverdale, Maryland 20737

Dear Board Members:

At your request, we have conducted an actuarial valuation of the Maryland-National Capital Park and Planning Commission (the Commission) Employees' Retirement System as of July 1, 2019. The valuation is organized as follows:

- In Section I **Board Summary,** we describe the purpose of an actuarial valuation and summarize the key results found in this valuation.
- The **Main Body** of the report presents details on the System's:
  - Section II - Identification and Assessment of Risk
  - Section III - Assets
  - Section IV - Liabilities
  - Section V - Contributions
  - Section VI - Accounting Statement Information
- In the **Appendices,** we conclude our report with detailed information describing the System's membership (Appendix A), actuarial assumptions and methods employed (Appendix B), a summary of pertinent plan provisions (Appendix C) and a glossary of terms (Appendix D).

The results of this report rely on future System experience conforming to the underlying assumptions. To the extent that actual System experience deviates from the underlying assumptions, the results will vary accordingly. The actuarial assumptions were adopted by the Board based on the recommended demographic assumptions shown in the Actuarial Assumption Review and Experience Study Covering July 1, 2011 through June 30, 2015, dated April 2016, prepared by the prior actuary, which was approved by the Board of Trustees. Cheiron has reviewed this experience study. While we consider these assumptions to be generally reasonable, we have not yet performed our own actuarial experience study.

The purpose of this report is to present the annual actuarial valuation of the Maryland-National Capital Park and Planning Commission Employees' Retirement System. This report is for the use of Board and its auditors in preparing financial reports in accordance with applicable law and accounting requirements. The report does not include calculations related to GASB Statements No. 67 and 68, which are provided in a separate report.

In preparing our report, we relied on information supplied by the Maryland-National Capital Park and Planning Commission Employees' Retirement System staff. This information includes, but is not limited to, 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 report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice as 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.

This actuarial report was prepared exclusively for the Maryland-National Capital Park and Planning Commission Employees' Retirement System for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

Sincerely,
Cheiron

Janet Cranna, FSA, FCA, EA, MAAA
Principal Consulting Actuary

Patrick Nelson, FSA, CERA, EA, MAAA
Associate Actuary

SECTION I – BOARD SUMMARY

The primary purpose of the actuarial valuation and this report is to measure, describe and identify as of the valuation date:

- The financial condition of the System,
- Past and expected trends in the financial progress of the System,
- The employers' contributions for Fiscal Year ending 2021,
- The risks of the System, and
- Information required for accounting statements.

In the balance of this Board Summary we present the basis upon which this year's valuation was completed, the key findings of this valuation including a summary of all key financial results, an examination of the historical trends, and the projected financial outlook for the System.

Results shown for years prior to July 1, 2019 were based on the prior actuary's valuation results.

Valuation Basis

This July 1, 2019 valuation represents Cheiron's first valuation performed for The Maryland-National Capital Park and Planning Commission (the Commission) Employees' Retirement System (ERS or the System).

Key Findings of this Valuation

The key results of the July 1, 2019 actuarial valuation are as follows:

- The actuarially determined employer contribution for the System increased from \$19.2 million for fiscal year ending June 30, 2020 to \$22.3 million for fiscal year ending June 30, 2021.
- There was an actuarial experience loss during the year of \$20.8 million.
  - During the year ended June 30, 2019, the System's assets had a 6.77% return on a market value basis, but due to smoothing of prior investment gains and losses, the return on the actuarial asset value was 5.63% (as compared to the 6.90% investment return assumption). This resulted in an actuarial loss on investments of \$11.7 million.
  - On the liability side, the System experienced a total loss of \$9.1 million. The primary contributors to this loss were active members retiring and terminating earlier than expected, salaries increasing more than expected and the cost-of-living adjustment for benefits earned after July 1, 2012 being greater than expected.
- The discount rate was reduced from 6.90% to 6.85% which increased the actuarial liability by \$5.9 million.

SECTION I – BOARD SUMMARY

- As a result of the experience loss and increases in liability due to the change in plan provisions and the discount rate assumption, the unfunded actuarial liability for the System increased from $50 million on July 1, 2018 to $76 million on July 1, 2019.
- The System's funded ratio, the ratio of actuarial asset value over liabilities, decreased from 94.9% as of July 1, 2018 to 92.7% as of July 1, 2019.

SECTION I – BOARD SUMMARY

Table I-1 summarizes all the key results of the valuation with respect to the System's membership, assets and liabilities, and contributions. The results are presented and compared for both the current and prior plan year.

Table I-1
Summary of Principal Results as of

	July 1, 2018[1]	July 1, 2019	% Change
Total System			
Number of Members			
Active	2,144	2,123	-0.98%
Terminated Vested	252	235	-6.75%
Terminated Non-Vested	397	426	7.30%
Retired, Beneficiaries, and Disabled	1,532	1,645	7.38%
Total	4,325	4,429	2.40%
Annual Compensation of Active Members	$ 156,444,006	$ 160,221,081	2.41%
Annual Retirement Allowances for Retired Members and Beneficiaries	$ 49,550,836	$ 54,378,109	9.74%
Discount Rate	6.90%	6.85%	
Assets and Liabilities			
Actuarial Liability (AL)	$ 993,322,340	$ 1,043,820,211	5.08%
Actuarial Value of Assets (AVA)	$ 943,070,635	$ 968,142,434	2.66%
Unfunded Actuarial Liability (UAL)	$ 50,251,705	$ 75,677,777	50.60%
Funded Ratio (AVA/AL)	94.94%	92.75%	-2.19%
Market Value of Assets (MVA)	$ 945,543,382	$ 981,261,569	3.78%
Funded Ratio (MVA/AL)	95.19%	94.01%	-1.18%
Recommended Contribution	**FYE 2020**	**FYE 2021**	
Total Contribution at the Beginning of the Year	$ 18,002,512	$ 20,882,495	16.00%
Contribution as a % of Payroll	11.51%	13.03%	1.52%
Total Contribution at the End of the Year	$ 19,244,687	$ 22,312,947	15.94%
Contribution as a % of Payroll	12.30%	13.93%	1.63%

[1] July 1, 2018 valuation results were determined by the prior actuary.

SECTION I – BOARD SUMMARY

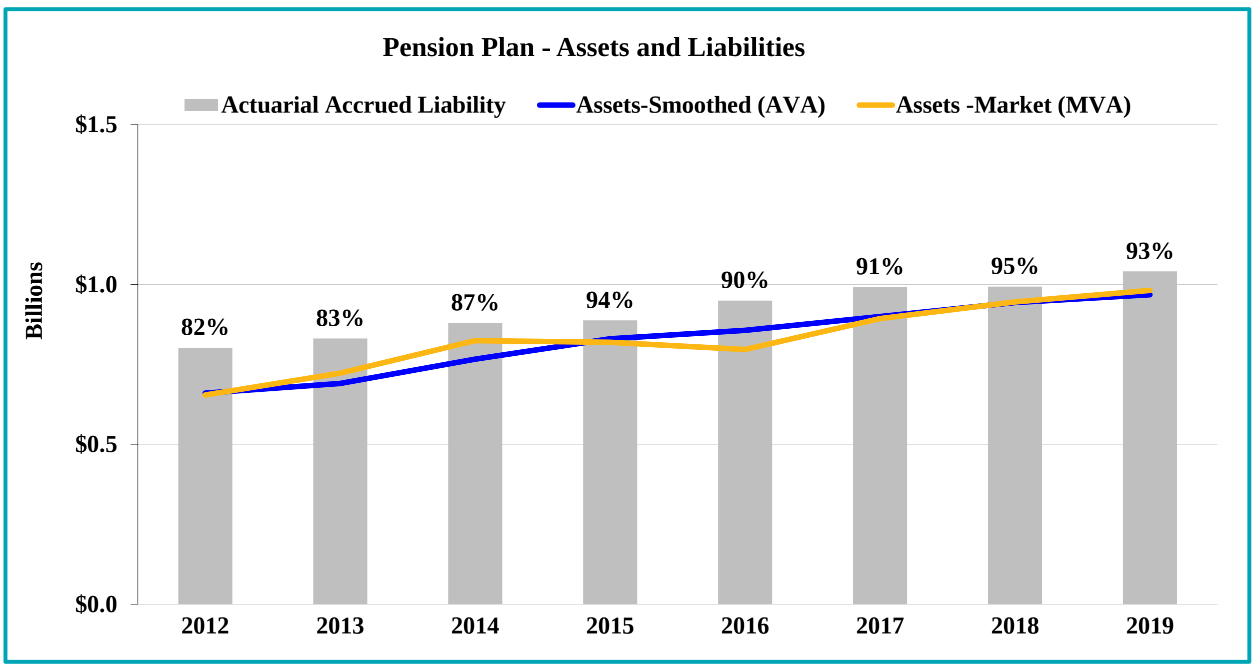
Historical Trends

Despite the fact that for most retirement systems the greatest attention is given to the current valuation results and in particular the size of the current unfunded actuarial liability and the employer's contribution, it is important to remember that each valuation is merely a snapshot in the long-term progress of a pension fund. It is more important to judge a current year's valuation result relative to historical trends, as well as trends expected into the future.

Assets and Liabilities

There was an increase in the market value of assets (MVA) from $946 million to $981 million, due to a 6.77% return during the year, which was less than the investment return assumption of 6.90%. With the asset smoothing method in place, the actuarial value of assets has tracked a smoother path through the volatility of the market over recent years. The actuarial value of assets (AVA) increased from 2018 to 2019 returning 5.63%, which includes two years of investment gains offset by the current year's loss and a substantial investment loss for the year ending in 2016.

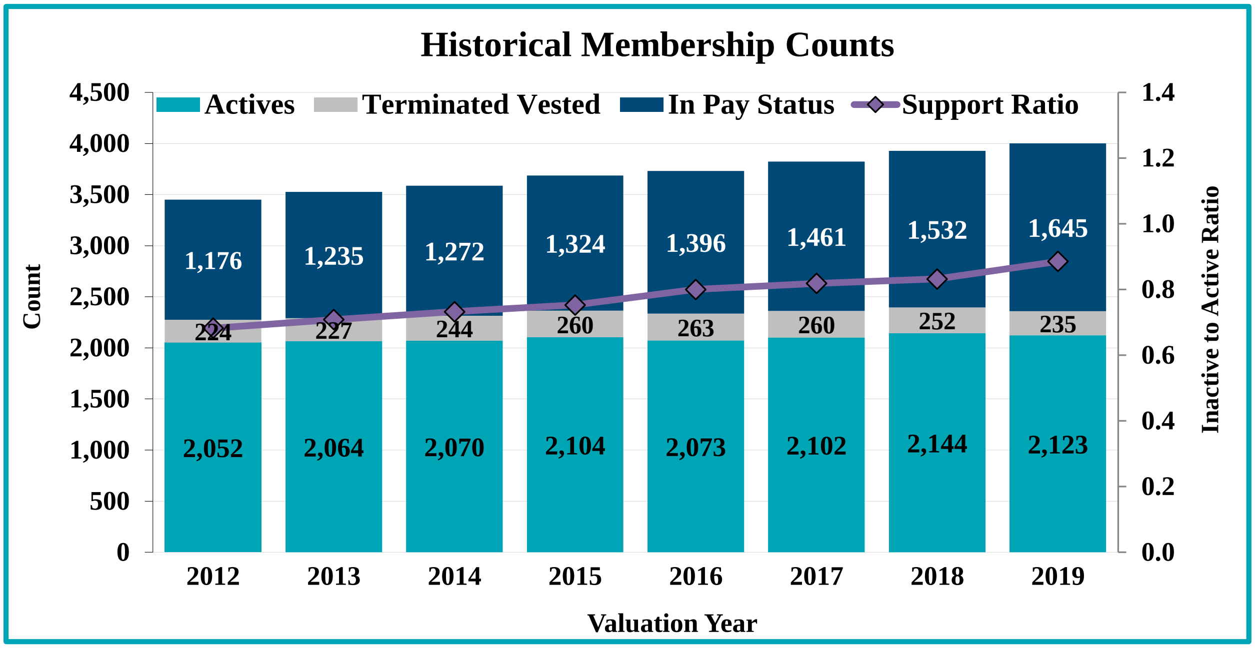
The chart below shows the actuarial value of assets (blue line), the market value of assets (gold line) and the actuarial liabilities (gray bars). The funded ratio (ratio of the actuarial value of assets to the actuarial liability) is shown above the gold bars. This chart shows that the funded ratio has generally increased over the past seven years.



SECTION I – BOARD SUMMARY

Participant Trends

The chart below provides a measure of the maturity of the System, by comparing the ratio of inactive members (in-pay and terminated vesteds) to active members. The inactive-to-active ratio has generally increased since 2012 from 0.68 inactive members per active member to 0.89 inactive members per active member. This increase is not necessarily bad in itself, but as more of the liability moves from actives to inactives, the System will experience more volatility in contribution rates when actuarial gains and losses are recognized.



SECTION I – BOARD SUMMARY

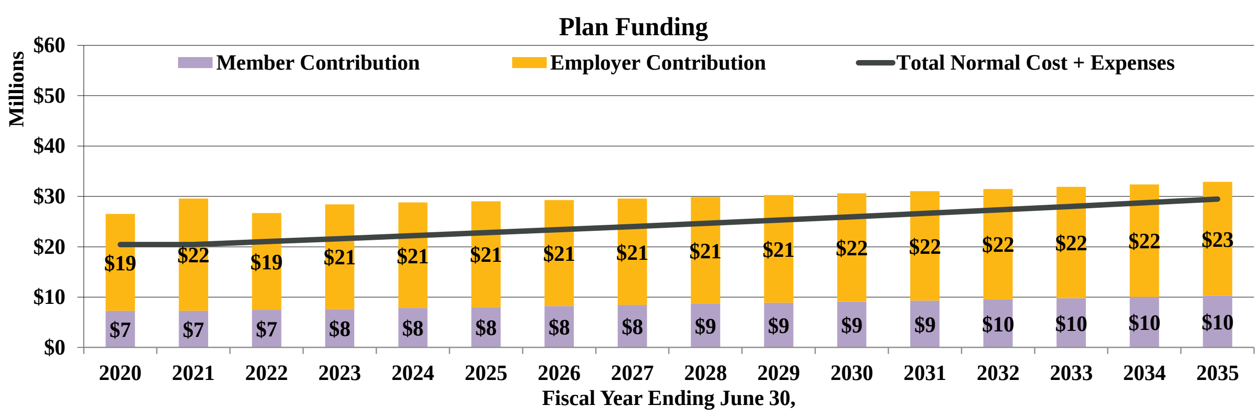
Future Expected Financial Trends

The analysis of projected financial trends is perhaps the most important component of the valuation. The charts presented in this section show the expected progress of the System's funded status over the next 15 years, measured in terms of the expected contributions and funded ratio, assuming that the System is ongoing.

The baseline projections assume all assumptions are realized, including the 6.85% investment return assumption. It is important to note that the experience will not conform exactly to the assumptions every year. As a result, in addition to the baseline projection of 6.85% investment returns, we provided additional stress testing based on varying investment returns in the future which are shown in section II.

Baseline returns of 6.85%

The first chart shows the total projected actuarially determined employer contribution (gold bars) and the member contributions (gray bars). The total normal cost, including administrative expenses, is represented by the black line. The years shown in the charts are fiscal years ending June 30.

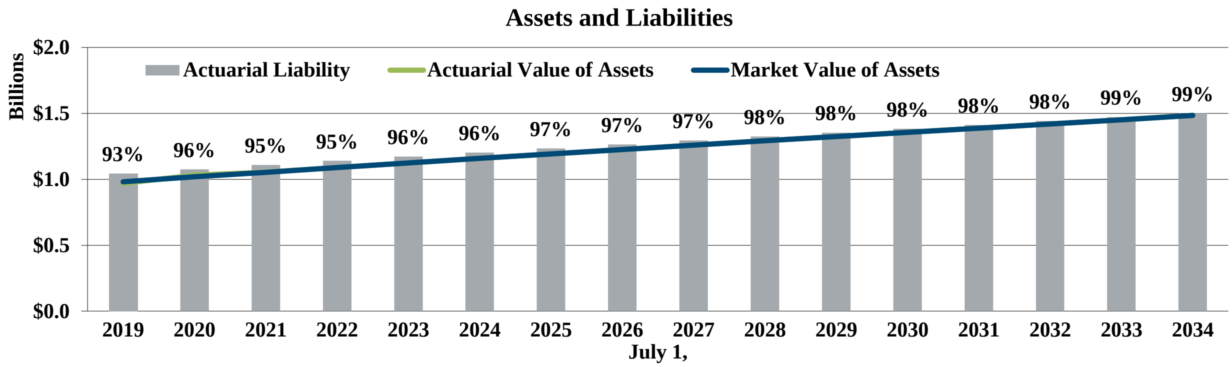


The chart above shows that the actuarially determined contribution will initially increase from $19 million to $22 million for fiscal year ending 2021, drop back to $19 million for fiscal year ending 2022 and then slowly increase to $23 million over the remainder of the 15 year period. This short term fluctuation in the contribution rate is due to the five-year phase in of asset gains and losses. The large loss for 2016 will be fully recognized for the fiscal year ending 2022 causing a decrease in the employer contribution, followed by the large gain in 2017 being fully recognized for fiscal year ending 2023 causing the contribution rate to increase. Due to the nature of a rolling amortization method, the process of fully amortizing the unfunded actuarial liability is slow and heavily contingent on investment returns exceeding the assumed rate of return. These projections assume that the System earns the assumed investment rate of 6.85% on market value.

SECTION I – BOARD SUMMARY

This next chart compares the market value of assets (blue line) and the actuarial or smoothed value of assets (green line) to the System's actuarial liabilities (gray bars). In addition, above the bars, we show the System's funded ratio (ratio of actuarial value of assets to actuarial liabilities). The projections assume that the actuarially determined contributions, as shown in the previous chart, are made each year. The years shown in the chart signify the valuation date as of July 1.

Assuming that the System earns the assumed investment rate of 6.85%, the funded ratio will increase from 93% to 99% during the 15 year projection period.



SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

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

The one fundamental risk to a pension plan is that the contributions needed to pay the benefits become unaffordable. While there are a number of factors that could lead to contribution amounts deviating from expectations, we believe the primary sources are:

- Investment risk,
- Longevity and other demographic risks,
- Plan change risk,
- Contribution risk; and
- Assumption change risk.

Other risks that we have not identified may also turn out to be important.

SECTION II – IDENTIFICATION AND ASSESSMENT 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 Plan'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.

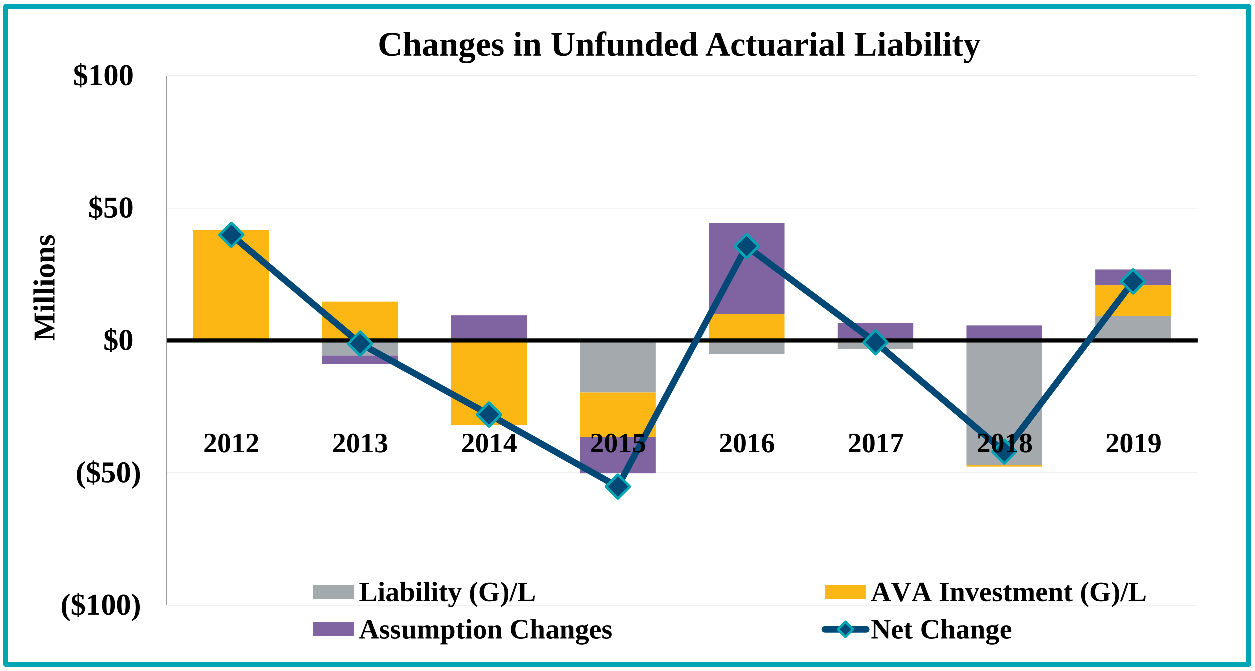
Plan Change Risk is the potential for the provisions of the System to be changed such that the funding or benefits are changed materially. In addition to the actual payments to and from the System being changed, future valuation measurements can also be impacted, with System changes leading to deviations between actual future measurements and those expected by the current valuation.

Contribution risk is the potential for actual future contributions to deviate from expected future contributions. There are different sources of contribution risk ranging from the sponsor choosing to not make contributions in accordance with the funding policy to material changes in the contribution base (e.g., covered employees, covered payroll, sponsor revenue) that affect the amount of contributions the plan can collect. Historically, the Plan has made contributions in accordance with their funding policy.

Assumption and plan change risk is the potential for the environment to change such that future valuation assumptions are different than the current assumptions. The positive assumption changes were related to experience studies in which demographic and economic assumptions were adjusted. 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.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

The chart below shows the components of changes in the Unfunded Actuarial Liability (UAL) for the System over the last 8 years, including investment gains and losses on the Actuarial Value of Assets, liability gains and losses, and assumption and plan changes. The net UAL change is shown by the dark blue line.



*Assumption Changes and Benefit Changes combined for years prior to 2018
The 2018 Liability (G)/L includes a programming change resulting in a $49 million gain

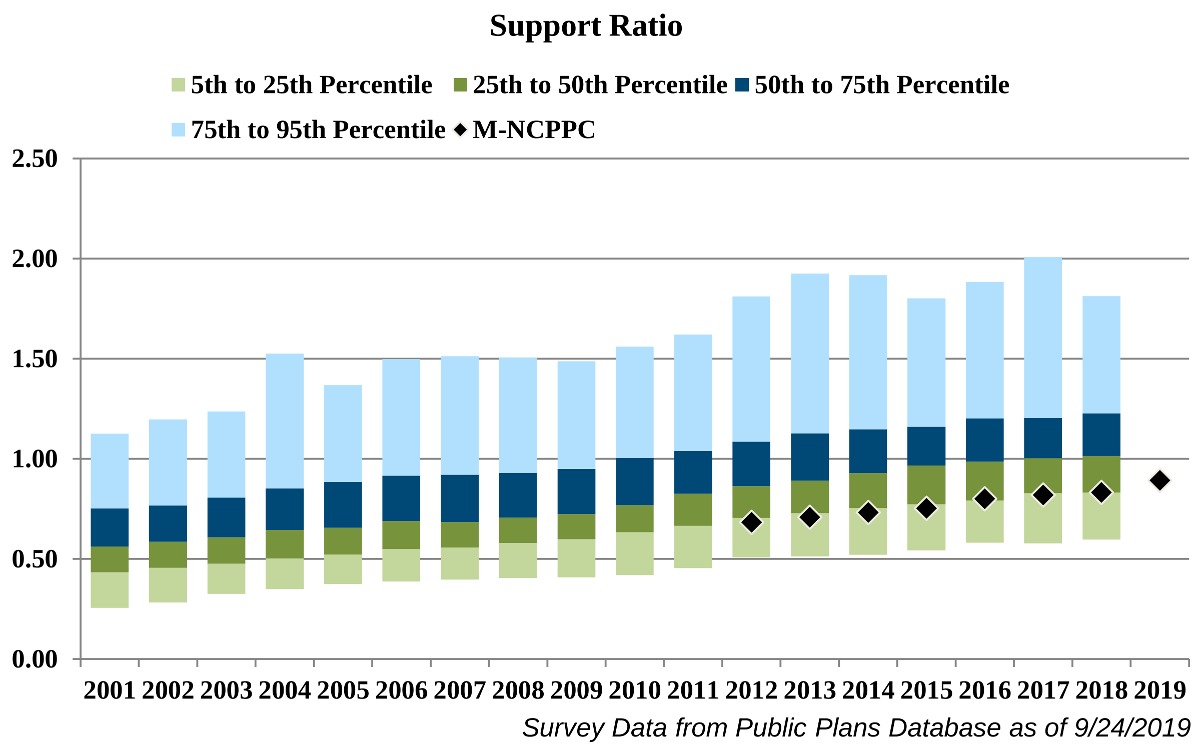
Plan Maturity Measures

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.



The chart 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.

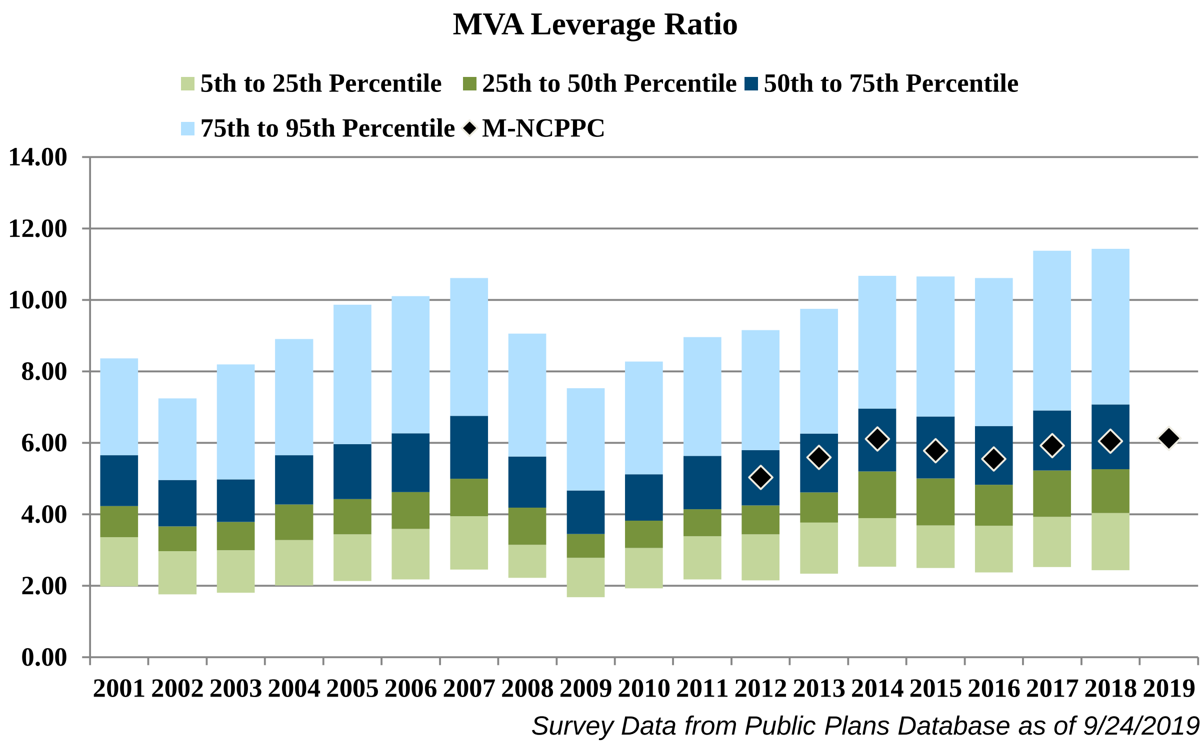
The support ratios for plans as a whole and the System have increased over the period as they mature. The System remains near the 25th percentile.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Leverage Ratios

Leverage or volatility ratios measure the size of the plan compared to its revenue base more directly.

An asset leverage ratio (the market value of assets divided by the plan's payroll) of 5.0, for example, means that if the system experiences a 10% loss on assets compared to the expected return, the loss would be equivalent to 50% of payroll. The same investment loss for a system with an asset leverage ratio of 10.0 would be equivalent to 100% of payroll. If the ratio was 100% funded, the leverage ratio would equal the Actuarial Liability (AL) leverage ratio. The greater the system's assets are relative to payroll, the more vulnerable the plan is to investment volatility.

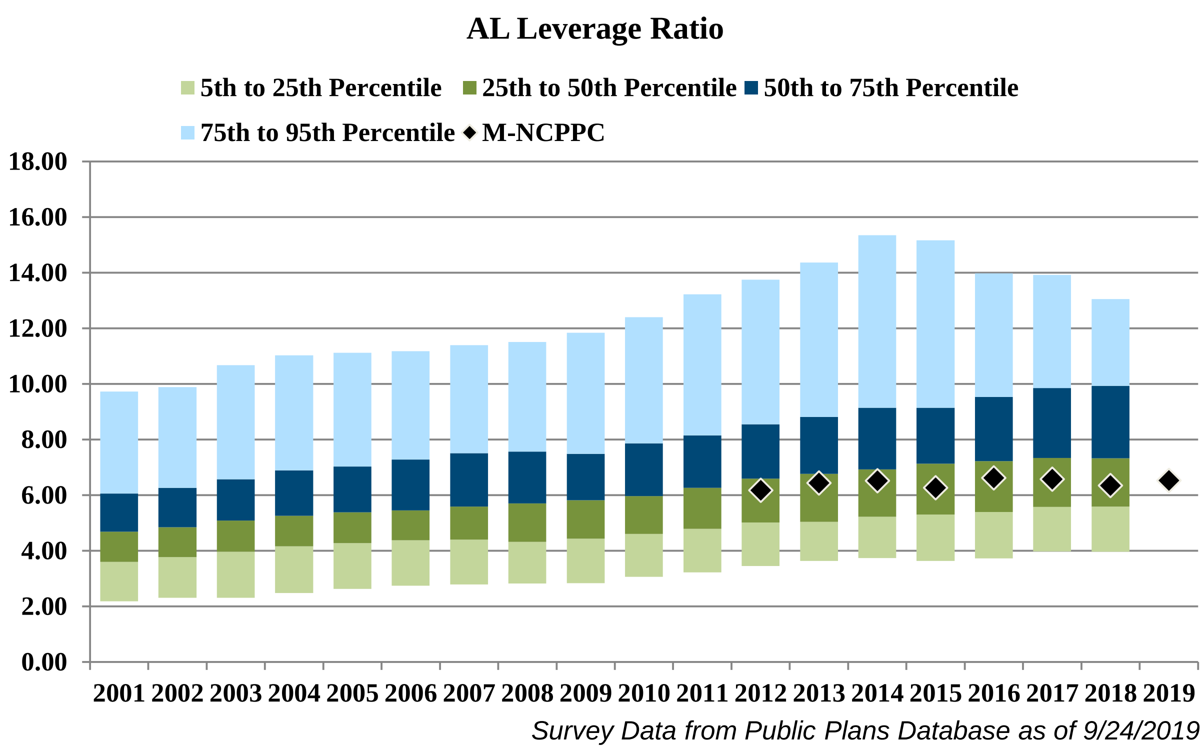


The chart above shows the distribution from the 5th to 95th percentile of asset leverage ratios for the plans in the Public Plans Database. The black diamond shows how the System compares.

The System's asset leverage ratio has historically been in the 50th to 75th percentile compared to other plans. This asset leverage ratio will continue to increase as the System approaches 100% funded.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

The actuarial liability (AL) leverage ratio (the ratio of actuarial liabilities to payroll) of 5.0 means that if a system experiences a 10% loss on assets compared to the expected return, the liability loss would be equivalent to 50% of payroll.



The chart above shows the distribution from the 5th to 95th percentile of Actuarial Liability leverage ratios for the plans in the Public Plans Database. The black diamond shows how the System compares.

The System's Actuarial Liability leverage ratio (the ratio of actuarial liabilities to payroll) has historically been in the 25th to 50th percentile compared to other plans. But as the plan matures and more of the liability is due to inactive members, this ratio continues to increase. The ratio has been between 6.0 and 7.0 during the period with the ratio currently around 6.5 in 2019.

Deterministic Scenarios/Stress Testing

We developed two hypothetical scenarios to illustrate the impact actual investment returns may have on future funded status and contribution rates. The two scenarios show periods of prolonged investment gains and investment losses, respectively, and the impacts of such results on employer contributions and the System's funded ratio.

The graphs on the following pages show the projections under each of these theoretical scenarios: optimistic returns of 8.35% per year and pessimistic returns of 5.35% per year.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

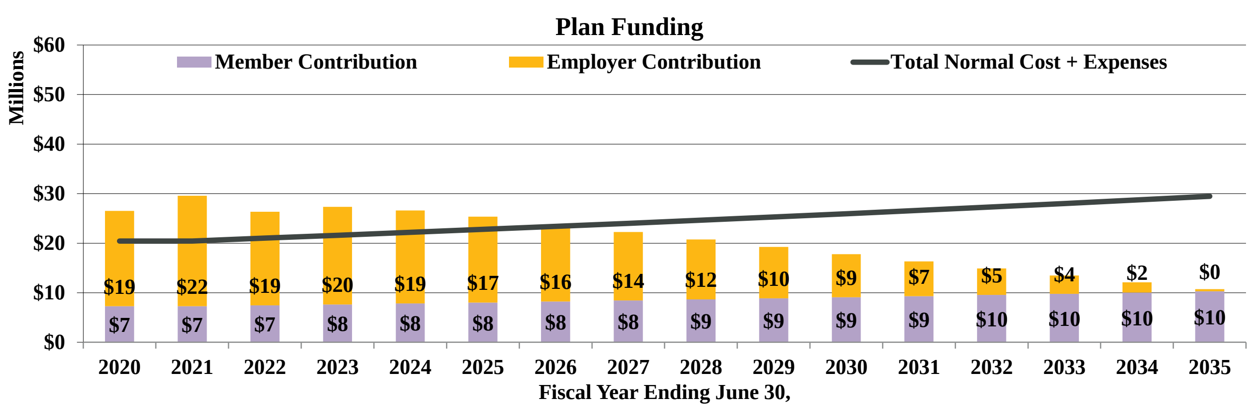
The top chart shows the System's projected actuarially determined employer contributions over the next 15 years.

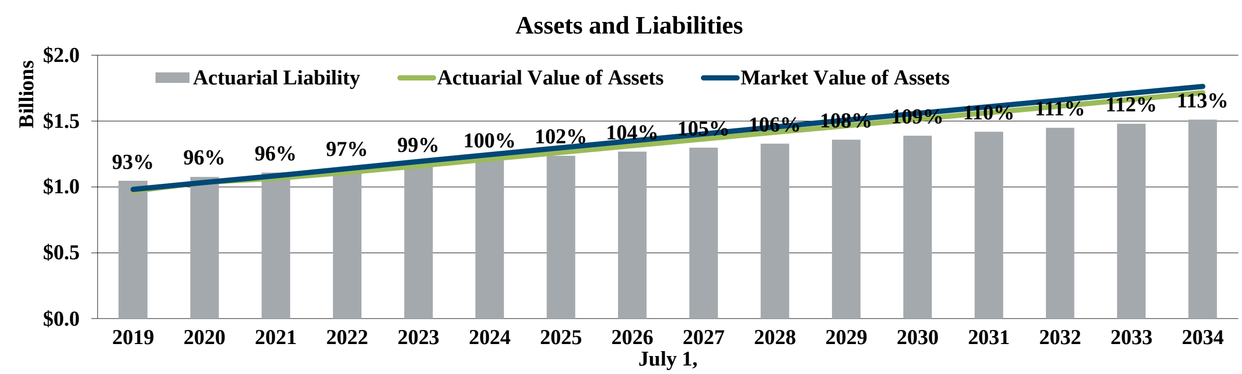
This bottom projection chart compares the market value of assets and the actuarial or smoothed value of assets to the System's actuarial liabilities. In addition, above the gray bars, we show the System's funded ratio on an actuarial value of assets basis (ratio of actuarial value of assets to actuarial liabilities).

Under the baseline results, we assumed a 6.85% investment return assumption per year. The baseline projections are shown in the Board Summary.

Optimistic returns of 8.35%

If the System earns 1.50% greater than the assumed rate in each year of the projection, the actuarially determined employer contribution will steadily decrease to less than $1 million in 15 years. By 2035, member contributions and the surplus assets will be sufficient to cover the majority of both the expected normal cost and administrative expenses. Additionally, the funded ratio is projected to increase to 100% by 2024 and 113% by the end of the 15 year projection period.

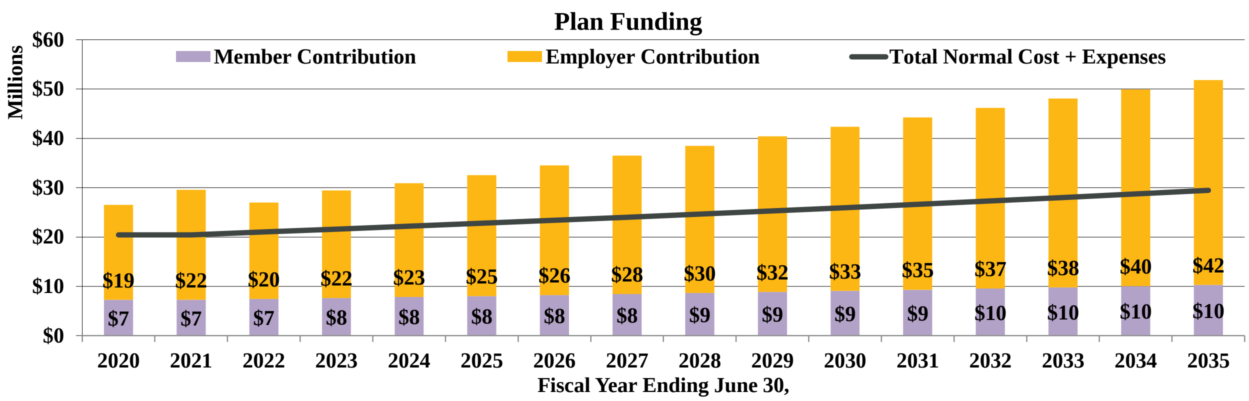


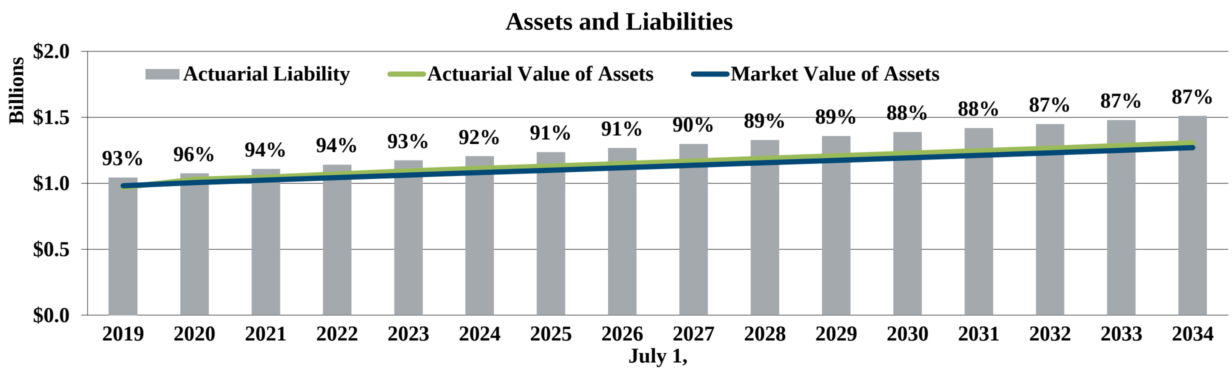


SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Pessimistic returns 5.35%

If the System earns 1.50% less than the assumed rate in each year of the projection, the actuarially determined employer contribution will steadily increase to $42 million as of 2035 as the unfunded liability continues to grow. Conversely, the funded ratio will slowly decrease to 87% by 2034 due to insufficient contributions based on the rolling amortization method leading to continuous underfunding.





SECTION III – ASSETS

Pension plan assets play a key role in the financial operation of the System and in the decisions the Trustees may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact benefit levels, employer contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on the System assets including:

- Disclosure of the System assets as of July 1, 2018 and July 1, 2019;
- Statement of the changes in market values during the year;
- Development of the Actuarial Value of Assets;
- Allocation of the Actuarial Value of Assets by Plan; and
- An assessment of investment performance.

Disclosure

There are two types of asset values disclosed in this valuation, the market value of assets (MVA) and the actuarial value of assets (AVA). The market value represents a "snap-shot" or "cash-out" value which provides the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are usually not as suitable for long-range planning as are the actuarial value of assets which reflect smoothing of annual investment returns.

SECTION III – ASSETS

Table III-1 below discloses and compares each asset value as of June 30, 2018 and June 30, 2019.

Table III-1
Statement of Assets at Market Value as of

	June 30, 2018	June 30, 2019	% change
Assets			
Fixed Income Securities	$ 227,922,933	$ 212,288,167	(6.86%)
International Fixed Income Securities	3,224,978	3,621,479	12.29%
Venture Capital/Alternative Investments	137,484,220	206,450,020	50.16%
Corporate Stock	370,228,825	359,403,418	(2.92%)
International Corporate Stock	74,080,706	79,337,936	7.10%
Real Estate	81,025,388	66,955,167	(17.37%)
Short Term Investments	28,650,722	35,438,010	23.69%
Securities Lending Short-term Collateral Investment	29,803,345	36,447,344	22.29%
Subtotal	**$ 952,421,117**	**$ 999,941,541**	4.99%
Cash Accounts	49,731	60,414	21.48%
Receivable-Member Contributions	66,531	96,099	44.44%
Accrued Income on Investments	793,376	818,120	3.12%
Prepaid Expenses	36,723	38,009	3.50%
Total Assets	**$ 953,367,478**	**$ 1,000,954,183**	4.99%
Liablilities			
Investments Payable	789,506	437,904	(44.53%)
Accrued Expenses	646,924	636,338	(1.64%)
Refunds Payable	628,977	677,730	7.75%
Payable for Securities Lending Collateral	30,550,782	37,185,329	21.72%
Total Liabilities	**$ 32,616,189**	**$ 38,937,301**	19.38%
Net Assets Held in Trust as of June 30	**$ 920,751,289**	**$ 962,016,882**	4.48%
Receivable Contributions	24,792,093	19,244,687	(22.38%)
Net Assets Held in Trust as of July 1	**$ 945,543,382**	**$ 981,261,569**	3.78%

SECTION III – ASSETS

Changes in Market Value

Table III-2 below shows the components of change between the market value of assets as of June 30, 2018 and June 30, 2019.

Table III-2
Changes in Market Values

Market Value of Assets as of June 30, 2018	**$ 945,543,382**
Contributions	
Employer Contributions	24,792,093
Member Contributions	7,541,076
Less Receivable for prior plan year	(24,792,093)
Subtotal	$ 7,541,076
Investment Income	
Interest	10,728,303
Dividends	2,268,453
Net Appreciation/(Depreciation)	52,697,180
Other	8,351
Less: Investment Advisory and Management Fees	(3,386,283)
Subtotal	$ 62,316,004
Securities Lending Activity	
Securities Lending Income	861,224
Securities Lending Expense	0
Borrower Rebate	(660,129)
Management Fees	(78,672)
Subtotal	$ 122,423
Deductions	
Benefit Payments (Includes Refunds of Contributions)	(51,801,905)
Administrative Expenses	(1,704,098)
Subtotal	$ (53,506,003)
Market Value of Assets as of June 30, 2019 (excluding receivable contribution)	**$ 962,016,882**
Receivable Contribution	$ 19,244,687
Market Value of Assets as of June 30, 2019 (including receivable contribution)	**$ 981,261,569**

SECTION III – ASSETS

Actuarial Value of Assets

The actuarial value of assets represents a "smoothed" value developed by the actuary to reduce, or eliminate erratic results which could develop from short-term fluctuations in the market value of assets. For this System, the actuarial value has been calculated by taking the market value of assets less 80% of the investment gain (loss) during the preceding year, less 60% of the investment gain (loss) during the second preceding year, less 40% of the investment gain (loss) during the third preceding year, and less 20% of the investment gain (loss) in the fourth preceding year. The investment gain (loss) is calculated by taking the difference between the expected value of assets, based on an expected return of 6.90% for the year ended June 30, 2019, and the actual value of assets. If the actuarial value of assets is less than 80% or more than 120% of the market value, an adjustment is made to the actuarial value to bring the value within this corridor.

Table III-3 shows how the actuarial value of assets is developed.

Table III-3
Development of Actuarial Value of Assets

Market value of assets at June 30, 2018 including receivables			$ 945,543,382
Employee Contributions			7,541,076
Benefit Payments			(51,801,905)
Administrative Expenses			(1,704,098)
Expected return at 6.90%			63,683,153
Expected value at June 30, 2019			$ 963,261,608
Market value of assets at June 30, 2019 before receivables			$ 962,016,882
Investment gain/(loss)			(1,244,726)
	Total Gain/(Loss)	% Excluded	
Investment gain/(loss) for 2019	$ (1,244,726)	80%	$ (995,781)
Investment gain/(loss) for 2018	8,019,015	60%	4,811,409
Investment gain/(loss) for 2017	55,570,276	40%	22,228,110
Investment gain/(loss) for 2016	(64,623,014)	20%	(12,924,603)
Total excluded gain/(loss) for AVA calculation			$ 13,119,135
AVA as of valuation date (before Contributions receivable)			$ 948,897,747
Contribution Receivable			19,244,687
AVA as of June 30, 2019 (after Contributions receivable)			968,142,434
MVA as of June 30, 2019 (after Contributions receivable)			981,261,569
AVA as a Percentage of MVA			98.66%

SECTION III – ASSETS

The method of allocating assets to each of the Plans is such that assets are first allocated to the full inactive actuarial liability and the remaining assets are then allocated proportionally to each Plan based on their share of the active actuarial liability. Table III-4 shows how the actuarial value of assets is allocated to each of the five Plans within the System.

Table III-4
Allocation of Actuarial Value of Assets and Unfunded Actuarial Liability

	Non-Police Plan A	Police Plan A	Plan B	Plan C	Plan D	Plan E	Total
Actuarial Value of Assets as of June 30, 2019							**$ 968,142,434**
Less: Inactive Member Liability	$ 128,255,476	$ 3,789,789	$ 392,434,718	$ 71,090,513	$ 73,501,910	$ 914,077	$ 669,986,483
AVA Net of Inactive Member Liability							298,155,951
Active Member Liability	0	0	287,547,738	66,135,965	1,749,607	18,400,418	373,833,728
AVA Allocated by Active Member Liability	0	0	229,337,437	52,747,599	1,395,422	14,675,493	298,155,951
Allocation of Actuarial Value of Assets	**$ 128,255,476**	**$ 3,789,789**	**$ 621,772,155**	**$ 123,838,112**	**$ 74,897,332**	**$ 15,589,570**	**$ 968,142,434**
Actuarial Liability as of July 1, 2019	$ 128,255,476	$ 3,789,789	$ 679,982,456	$ 137,226,478	$ 75,251,517	$ 19,314,495	$ 1,043,820,211
Unfunded Actuarial Liability	**$ 0**	**$ 0**	**$ 58,210,301**	**$ 13,388,366**	**$ 354,185**	**$ 3,724,925**	**$ 75,677,777**

SECTION III – ASSETS

Investment Performance

The market value of assets returned 6.77% during the fiscal year ending June 30, 2019, which is less than the assumed 6.90% assumption for the period. A return of 5.63% was experienced on the actuarial value of assets, resulting in an actuarial loss for the year. Below, we show a comparison of the assumed rate of return, the actual rate of return on both the market value and actuarial value of assets, as well as additional historical returns.

Table III-5
Investment Performance Comparison

FYE June 30,	Assumed Rate of Return	Market Value of Assets	Actuarial Value of Assets	S&P 500 Index	Barclays Aggregate Bond Index	90-Day U.S. Treasuries	Consumer Price Index
2019	6.90%	6.77%	5.63%	10.42%	7.87%	2.08%	1.65%
2018	6.95%	8.08%	7.02%	14.40%	-0.40%	1.89%	2.87%
2017	7.00%	14.37%	6.97%	17.90%	-0.31%	1.01%	1.63%
2016	7.25%	-0.61%	5.42%	3.99%	6.00%	0.26%	1.00%
2015	7.30%	0.41%	9.61%	1.23%	-0.10%	0.01%	0.12%
5-Year Average	7.08%	5.66%	6.92%	9.41%	2.55%	1.05%	1.45%

SECTION IV – LIABILITIES

In this section, we present detailed information on the System liabilities including:

- **Disclosure** of the System liabilities as of July 1, 2018 and July 1, 2019, and
- Statement of **changes** in these liabilities during the year.

Disclosure

Two types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them.

- **Present Value of All Future Benefits:** Used for measuring all future System obligations, represents the amount of money needed today to fully fund all benefits of the System both earned as of the valuation date and those expected to be earned in the future by current plan participants, under the current plan provisions.
- **Actuarial Liability:** Calculated as of the valuation date as the present value of benefits allocated to service prior to that date. The actuarial liability is determined using the Entry Age Normal method.

These liabilities are for funding purposes and are not appropriate for measuring the cost of settling plan liabilities by purchasing annuities or paying lump sums.

Table IV-1, which follows, discloses each of these liabilities for the current valuation. With respect to each disclosure, a subtraction of the appropriate value of plan assets yields, for each respective type, a **net surplus** or an **unfunded liability**.

SECTION IV – LIABILITIES

Table IV-1
Liabilities by Plan as of July 1, 2019

	Non-Police Plan A	Police Plan A	Plan B	Plan C	Plan D	Plan E	Total
Present Value of Future Benefits							
Active	$ 0	$ 0	$ 359,417,238	$ 100,130,201	$ 1,833,164	$ 77,490,455	$ 538,871,058
Terminated Vested	0	0	21,714,998	1,737,348	90,681	0	23,543,027
Terminated Non Vested	0	0	1,145,801	119,804	4,344	592,985	1,862,934
Retired, Disabled and Survivor	128,255,476	3,789,789	369,573,919	69,233,361	73,406,885	321,092	644,580,522
Total	**$ 128,255,476**	**$ 3,789,789**	**$ 751,851,956**	**$ 171,220,714**	**$ 75,335,074**	**$ 78,404,532**	**$ 1,208,857,541**
Actuarial Liability							
Active	$ 0	$ 0	$ 287,547,738	$ 66,135,965	$ 1,749,607	$ 18,400,418	$ 373,833,728
Terminated Vested	0	0	21,714,998	1,737,348	90,681	0	23,543,027
Terminated Non Vested	0	0	1,145,801	119,804	4,344	592,985	1,862,934
Retired, Disabled and Survivor	128,255,476	3,789,789	369,573,919	69,233,361	73,406,885	321,092	644,580,522
Total	**$ 128,255,476**	**$ 3,789,789**	**$ 679,982,456**	**$ 137,226,478**	**$ 75,251,517**	**$ 19,314,495**	**$ 1,043,820,211**
Actuarial Value of Assets	**$ 128,255,476**	**$ 3,789,789**	**$ 621,772,155**	**$ 123,838,112**	**$ 74,897,332**	**$ 15,589,570**	**$ 968,142,434**
Unfunded Actuarial Liability	**$ 0**	**$ 0**	**$ 58,210,301**	**$ 13,388,366**	**$ 354,185**	**$ 3,724,925**	**$ 75,677,777**

Changes in Liabilities

Each of the Liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- System amendments changing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above, and also due to changes in plan assets resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the method used to measure plan assets

In each valuation, we report on those elements of change which are of particular significance, potentially affecting the long-term financial outlook of the System. Below, we present key changes in liabilities since the last valuation.

SECTION IV – LIABILITIES

Table IV-2 shows the components of change in the actuarial liability between July 1, 2018 and July 1, 2019.

Table IV-2
Change in Liabilities

	Actuarial Accrued Liability
Liabilities as of July 1, 2018	$ 993,322,340
Liabilities as of July 1, 2019	$ 1,043,820,211
Liability Increase / (Decrease)	50,497,871
Change Due to:	
Recalculation of Prior Liability	$ 1,973,241
Actuarial (Gain) / Loss	9,138,464
Assumption Changes	5,899,357
Benefits Accumulated and Other Sources	33,486,809
Total	$ 50,497,871

Table IV-3 shows the change in the actuarial (gain)/loss by source.

Table IV-3
Sources of (Gain) / Loss

	(Gain) / Loss	% of Liability
New members entering System	$ 361,753	0.0%
Salary increases greater than expected	2,585,472	0.3%
Active member decrements	5,034,887	0.5%
Inactive mortality	136,288	0.0%
Retiree COLA greater than expected	4,575,860	0.5%
Benefit Payments less than expected	(4,482,821)	-0.5%
Miscellaneous changes	927,025	0.1%
Total	$ 9,138,464	0.9%

SECTION V – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the System. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both stable and predictable.

For this System, the funding method employed is the **Entry Age Normal Actuarial Cost Method**. Under this funding method, a normal cost rate is determined as a level percentage of pay for each active member. The normal cost rate multiplied by payroll equals the total normal cost for each active member. The total anticipated member contributions for the year are then subtracted from the sum of the total normal cost to arrive at the employer normal cost. The normal cost contributions (employer and active member) will pay for projected benefits at retirement for each active member. An administrative expense rate of 0.20% of actuarial liabilities is added to the normal cost. The administrative expense rate is based on recommendations of the prior actuary. Cheiron has not yet performed an analysis to determine whether the administrative expense rate is reasonable or whether the allocation of the administrative expense among the Plans is reasonable.

The EAN actuarial liability is the difference between the plan's total present value of future benefits and the present value of future normal costs. The difference between the Entry Age Normal actuarial liability and the actuarial value of assets is the unfunded actuarial liability. The unfunded actuarial liability is amortized as a level dollar over an open 15-year period.

SECTION V – CONTRIBUTIONS

Table V-1 below develops the employer contribution rates for the System for the fiscal year ending June 30, 2021.

Table V-1
Determination of Employer Contribution

	Non-Police Plan A	Police Plan A	Plan B	Plan C	Plan D	Plan E	Total
Active Member Payroll	$ 0	$ 0	$ 92,037,379	$ 17,162,005	$ 205,376	$ 50,816,321	$ 160,221,081
Normal Costs							
Gross Normal Cost	$ 0	$ 0	$ 9,454,459	$ 3,352,122	$ 33,175	$ 5,516,410	$ 18,356,166
Estimated Expenses	256,511	7,580	1,359,965	274,453	150,503	38,629	2,087,641
Reduction due to Expected Employee Contributions	0	0	3,703,524	1,459,760	21,895	2,078,955	7,264,134
Net Employer Normal Cost	$ 256,511	$ 7,580	$ 7,110,900	$ 2,166,815	$ 161,783	$ 3,476,084	$ 13,179,673
Amortization Payment	$ 0	$ 0	$ 5,924,904	$ 1,362,728	$ 36,051	$ 379,139	$ 7,702,822
--As a % of Payroll	0.00%	0.00%	6.44%	7.94%	17.55%	0.75%	4.81%
Actuarially Determined Employer Contribution payable at Beginning of Year	**$ 256,511**	**$ 7,580**	**$ 13,035,804**	**$ 3,529,543**	**$ 197,834**	**$ 3,855,223**	**$ 20,882,495**
--As a % of Payroll	0.00%	0.00%	14.16%	20.57%	96.33%	7.59%	13.03%
Actuarially Determined Employer Contribution payable at End of Year	**$ 274,082**	**$ 8,099**	**$ 13,928,757**	**$ 3,771,317**	**$ 211,386**	**$ 4,119,306**	**$ 22,312,947**
--As a % of Payroll	0.00%	0.00%	15.13%	21.97%	102.93%	8.11%	13.93%

SECTION V – CONTRIBUTIONS

Table V-2 shows a breakdown of the employer contributions for the fiscal year ending 2021 between Park Police and Non-Police members:

Table V-2
Police and Non-Police Contribution

	Contribution for FYE June 30, 2021	2019 Payroll	Contribution as % of Payroll
Non-Police	$ 18,322,145	$ 142,853,700	12.83%
Park Police	3,990,802	17,367,381	22.98%
Total	$ 22,312,947	$ 160,221,081	13.93%

SECTION V – CONTRIBUTIONS

Table V-3 provides a 10-year projection of employer costs as a total dollar amount and as a percentage of the prior year payroll. The total cost is split by each of the components included in the total employer contribution.

Table V-3
10-Year Projection of Employer Costs (dollars in millions)

Fiscal Year Ending June 30,	Normal Cost	Amortization of UAL	Estimated Expenses	Interest to End of Year	Total Employer Contribution	Prior Year Payroll	Employer Contribution as % of Payroll
2021	$11,092,032	$ 7,702,822	$ 2,087,641	$ 1,430,452	$ 22,312,947	$ 160,221,081	13.93%
2022	11,406,638	4,428,661	2,153,228	1,232,214	19,220,741	164,226,608	11.70%
2023	11,729,273	5,480,155	2,218,575	1,330,818	20,758,821	168,332,273	12.33%
2024	12,061,155	5,260,421	2,283,694	1,342,961	20,948,231	172,540,580	12.14%
2025	12,401,113	4,875,523	2,348,239	1,344,304	20,969,179	176,854,095	11.86%
2026	12,750,103	4,533,048	2,410,971	1,349,047	21,043,169	181,275,447	11.61%
2027	13,104,633	4,203,845	2,473,346	1,355,055	21,136,879	185,807,333	11.38%
2028	13,468,020	3,887,241	2,535,070	1,362,488	21,252,819	190,452,516	11.16%
2029	13,838,200	3,582,574	2,596,563	1,371,188	21,388,525	195,213,829	10.96%
2030	14,216,434	3,289,225	2,657,989	1,381,210	21,544,858	200,094,175	10.77%
2031	14,602,841	3,006,596	2,718,442	1,392,460	21,720,339	205,096,529	10.59%

SECTION VI – ACCOUNTING STATEMENT INFORMATION

GFOA Recommended Information

The Government Finance Officers Association (GFOA) maintains a checklist of items to be included in a public retirement system's Comprehensive Annual Financial Report (CAFR) in order to receive recognition for excellence in financial reporting. Because the Employees' Retirement System issues a CAFR under GFOA guidelines, we have included certain schedules in this section for possible inclusion within the System's audited financial statements. These schedules are based on the funding actuarial liabilities.

- Table VI-1: Schedule of Funded Liabilities by Type
- Table VI-2: Schedule of Funding Progress

Table VI-1
Schedule of Funded Liabilities by Type

	Aggregate Actuarial Liabilities for				Portion of Actuarial Liabilities Covered by Reported Assets		
Actuarial Valuation Date	Active Member Contributions (1)	Inactive Members (2)	Active Members (Employer Financed Portion) (3)	Actuarial Value of Assets	(1)	(2)	(3)
July 1, 2019	$ 81,289,107	$ 669,986,483	$ 292,544,621	$ 968,142,434	100%	100%	74%
July 1, 2018	79,764,769	619,013,482	294,544,089	943,070,635	100%	100%	83%
July 1, 2017	77,964,472	576,223,626	337,436,639	899,336,519	100%	100%	73%
July 1, 2016	74,857,685	541,562,389	332,878,152	856,279,531	100%	100%	72%
July 1, 2015	72,702,687	531,683,180	283,101,507	830,052,104	100%	100%	80%
July 1, 2014	68,872,476	516,903,400	293,414,513	766,531,514	100%	100%	62%
July 1, 2013	64,747,601	501,072,738	265,379,253	690,539,998	100%	100%	47%
July 1, 2012	61,843,880	466,927,776	273,305,709	660,231,611	100%	100%	48%
July 1, 2011	57,659,169	461,475,412	242,208,419	659,362,107	100%	100%	58%
July 1, 2010	58,059,065	408,689,438	297,111,636	609,902,953	100%	100%	48%

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-2
Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (b)	Unfunded Actuarial Liability (b) - (a)	Funded Ratio (a) / (b)
July 1, 2019	$ 968,142,434	$ 1,043,820,211	$ 75,677,777	92.75%
July 1, 2018	943,070,635	993,322,340	50,251,705	94.94%
July 1, 2017	899,336,519	991,624,737	92,288,218	90.69%
July 1, 2016	856,279,531	949,298,226	93,018,695	90.20%
July 1, 2015	830,052,104	887,487,374	57,435,270	93.53%
July 1, 2014	766,531,514	879,190,389	112,658,875	87.19%
July 1, 2013	690,539,998	831,199,592	140,659,594	83.08%
July 1, 2012	660,231,611	802,077,365	141,845,754	82.32%
July 1, 2011	659,362,107	761,343,000	101,980,893	86.61%
July 1, 2010	609,902,953	763,860,139	153,957,186	79.84%

APPENDIX A – MEMBERSHIP INFORMATION

Membership Data as of July 1, 2019

Active Members

	Plan A Non-Police	Plan A Police	Plan B	Plan C	Plan D	Plan E	Total
Count	0	0	1,142	205	2	774	2,123
Average Age	N/A	N/A	52.88	40.41	55.63	40.70	47.24
Average Service	N/A	N/A	17.62	10.37	27.67	2.74	11.50
Total Salary	N/A	N/A	$ 92,037,379	$ 17,162,005	$ 205,376	$ 50,816,321	$ 160,221,081
Average Salary	N/A	N/A	80,593	83,717	102,688	65,654	75,469

Inactive Members

	Plan A Non-Police	Plan A Police	Plan B	Plan C	Plan D	Plan E	Total
Retired							
Count	210	7	1,016	73	92	0	1,398
Average Age	75.79	83.32	68.48	59.52	64.09	N/A	68.90
Total Annual Benefits	$ 10,994,817	$ 267,942	$ 28,724,114	$ 4,295,900	$ 4,508,165	N/A	$ 48,790,938
Average Annual Benefit	52,356	38,277	28,272	58,848	49,002	N/A	34,901
Beneficiaries							
Count	63	5	114	3	15	1	201
Average Age	80.21	80.27	68.92	45.85	69.92	5.00	72.15
Total Annual Benefits	$ 1,652,769	$ 138,831	$ 1,971,219	$ 91,726	$ 765,208	$ 10,564	$ 4,630,318
Average Annual Benefit	26,234	27,766	17,291	30,575	51,014	10,564	23,036
Disabled							
Count	1	4	33	5	1	2	46
Average Age	96.50	74.33	57.05	44.55	53.71	47.00	57.54
Total Annual Benefits	$ 21,373	$ 75,243	$ 632,390	$ 144,455	$ 41,574	$ 41,818	$ 956,853
Average Annual Benefit	21,373	18,811	19,163	28,891	41,574	20,909	20,801
Terminated Vested							
Count	0	0	224	10	1	0	235
Average Age	N/A	N/A	49.55	44.67	59.93	N/A	49.39
Total Annual Benefits	N/A	N/A	$ 2,486,538	$ 153,671	$ 6,116	N/A	$ 2,646,325
Average Annual Benefit	N/A	N/A	11,101	15,367	6,116	N/A	11,261
Terminated Non-Vested							
Count	0	0	285	27	2	112	426
Average Age	N/A	N/A	49.95	39.83	57.85	37.62	46.10
Total Account Balance	N/A	N/A	$ 1,145,801	$ 119,804	$ 4,344	$ 592,985	$ 1,862,934
Average Account Balance	N/A	N/A	4,020	4,437	2,172	5,295	4,373

	Plan A Non-Police	Plan A Police	Plan B	Plan C	Plan D	Plan E	Total
Grand Total							
Count	274	16	2,814	323	113	889	4,429

APPENDIX A – MEMBERSHIP INFORMATION

Member Status Reconciliation						
	Active	Disabled	Retired	Beneficiary	Term Vested	Total
July, 1, 2018[1]	**2,135**	**19[2]**	**1,325**	**197**	**252**	**3,928**
New hires	184					**184**
Re-hires	3				(3)	**0**
Term vested	(15)				15	**0**
Retired	(88)		112		(24)	**0**
Disabled	(28)	28				**0**
Deceased (with beneficiary)	(4)		(8)	12		**0**
Deceased (without beneficiary)			(31)	(8)		**(39)**
Term Non-vested	(42)					**(42)**
Return of Contributions	(22)	(1)			(5)	**(28)**
Net Change	(12)	27	73	4	(17)	**75**
July, 1, 2019[3]	**2,123**	**46[4]**	**1,398**	**201**	**235**	**4,003**

[1] In addition, as of July 1, 2018, there were 397 terminated non-vested participants due a refund of member contributions.
[2] Includes 9 members on Long-Term Disability valued with a deferred disability benefit.
[3] In addition, as of July 1, 2019, there were 426 terminated non-vested participants due a refund of member contributions.
[4] Includes 27 members on Long-Term Disability valued with a deferred disability benefit.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

1. Mortality Rates

Healthy Retirees: RP-2000 Healthy Mortality Table with male rates set forward one year and female rates set forward two years, projected generationally with Scale BB

Disabled Retirees: RP-2000 Disabled Annuitant Table with male rates set forward one year and female rates set forward two years, projected generationally with Scale BB

Actives: 50% of the RP-2000 Healthy Mortality Table with male rates set forward one year and female rates set forward two years, projected generationally with Scale BB

Park Police: 90% of deaths are assumed to be service related
Non-Park Police: 33% of deaths are assumed to be service related

2. Disability

Sample rate are as follows:

Age	Park Police	Non-Police
25	0.2560%	0.0705%
30	0.3660%	0.1103%
35	0.5080%	0.1643%
40	0.6930%	0.2468%
45	0.9400%	0.3833%
50	1.3540%	0.6285%
55	2.2880%	0.7500%
60	3.4340%	1.5803%

3. Withdrawal:

Sample rates are as follows:

Park Police		Non-Police		
Years of Service	Unisex	Years of Service	Male	Female
0	11.0%	0	9.0%	11.7%
2	7.0	5	4.7	6.2
4	4.5	10	2.5	3.3
6	2.9	15	1.3	1.7
8	1.8	20	0.7	0.9
10	1.2	25+	0.0	0.0
15+	0.0			

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

4. Retirement Rates from Active or Terminated Vested Status:

Sample rates are as follows:

Years of Service[1]	Park Police	Age	Non-Police
5-19	5.0%	45	2.5%
20 – 29	10.0	50	4.0
30+	100.0	55	6.5
		60	10.4
		65	16.8
		70	100.0

[1] 100% retirement at age 65

5. Marriage

90% of male active members and 50% of female members are assumed to be married. The male spouse is assumed to be three years older than the female.

6. Investment Return

6.85% compounded annually, net of investment expenses.

7. Salary Increases

Wage inflation is assumed to be 2.50%. Individual salaries are expected to increase according to the following table which includes wage inflation and merit.

Years of Service	Park Police	Non-Police
0	6.50%	5.00%
5	5.50	4.75
10	4.75	4.50
15	4.50	4.00
20	4.50	3.50
25	4.50	2.50

8. Cost-of-Living Adjustments

2.40% compounded annually for benefits based on credited service accrued up to July 1, 2012 and sick leave accrued until January 1, 2013; 2.00% compounded thereafter.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

9. Unused Sick Leave Service Credit

Accrued at a rate of 0.36 additional months per year of service.

10. Non-Service-Connected Death Benefit Election

All Plan B participants are assumed to elect the annuity payable for life (default) if eligible for the non-service-connected death benefit.

11. Expenses

Administrative expenses are added to the Normal Cost and are assumed to be 0.2% of the Actuarial Liability.

The assumed investment rate of return is deemed to be net of investment expenses.

12. Social Security Wage Base Increase

3.0% compounded annually.

13. Rationale for actuarial assumptions

The actuarial assumptions were adopted by the Board of Trustees based upon recommendations made in an actuarial experience study performed by the prior actuary covering the period July 1, 2011 through June 30, 2015. Cheiron has reviewed this experience study. While we consider these assumptions to be generally reasonable, we have not yet performed our own actuarial experience study.

14. Changes in Actuarial Assumptions

The assumed rate of return has been lowered from 6.90% to 6.85%.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

1. Actuarial Value of Assets

The actuarial value of assets has been calculated by taking the market value of assets less 80% of the investment gain (loss) during the preceding year, less 60% of the investment gain (loss) during the second preceding year, less 40% of the investment gain (loss) during the third preceding year, and less 20% of the investment gain (loss) in the fourth preceding year.

The investment gain (loss) is calculated by taking the difference between the expected market value of assets and the actual market value of assets.

If the actuarial value of assets is less than 80% or more than 120% of the market value, an adjustment is made to the actuarial value to bring the value within this corridor.

2. Actuarial Cost Method

The funding method for the valuation of liabilities used for this valuation is the Entry Age Normal (EAN) method. Under this funding method, a normal cost rate is determined as a level percentage of pay for each active member. The normal cost rate multiplied by payroll equals the total normal cost for each active member. The normal cost contributions (employer and active member) will pay for projected benefits at retirement for each active member.

The actuarial liability is the difference between the present value of future benefits and the present value of future normal costs. The difference between this actuarial liability and the actuarial value of assets is the unfunded actuarial liability (UAL).

The portion of the actuarial liability in excess of System assets, the UAL, is amortized to develop an additional cost that is added to each year's employer normal cost. Under this funding method, actuarial gains and losses are directly reflected in the size of the unfunded actuarial liability. The amortization method is described below.

3. Amortization Method

The Unfunded Actuarial Liability is amortized as a level dollar over an open 15-year period.

4. Changes in Actuarial Methods

None

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Plan A	Plan B	Plan C	Plan D	Plan E
Effective Date	7/1/1972. Closed 1/1/1979.	1/1/1979 for full time employees. 3/1/1994 for ERS employees. 1/1/2009 for part-time career and certain other individuals	1/1/1979. Closed: 7/1/1990 Reopened: 7/1/1993	7/1/1990. Closed 7/1/1993.	1/1/2013 for employees hired or appointed after 1/1/2013.
Employee	Any individual employed by the Commission as a career Merit System employee, Executive Director, Secretary – Treasurer, General Counsel, or Commissioner of the M-NCPPC.	Any individual employed by the Commission as a career Merit System employee, Executive Director, Secretary – Treasurer, General Counsel, or Commissioner of the M-NCPPC or any individual employed by the M-NCPPC Employees' Retirement System.	Career Park Police officer exempted from the Merit System and appointed by the respective County Planning Board.	Same as Plan C.	Same as Plan B.
Member	Any employee who elected to become a member of the Plan prior to 1/1/1979 and has not terminated or transferred to Plan B, C, or D.	Any full time employee or ERS employee hired on or after the applicable effective date, or any employee transferred from Plan A to Plan B or certain employees who exercised their option to participate voluntarily in Plan B.	Every full-time Park Police officer appointed by the Commission after 7/1/1993. Beginning 2/1/2002 and ending 10/25/2002, any Plan D active member could elect to transfer to Plan C.	Beginning 3/1/1992, a Park Police officer who is in Plan A could elect to become a member in Plan D. All Plan C active members as of 6/30/1990 were transferred to Plan D.	Any full time or part time employee (hired on a year round basis) on or after the applicable effective date.
Annual Compensation	The base pay i.e. the rate of gross earnable compensation excluding overtime pay or additional compensation.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan B.
Average Annual Earnings	The average for the three consecutive years of compensation that produce the highest earnings prior to reaching the service cap.	Same as Plan A.	Same as Plan A.	Same as Plan A.	The average for the five consecutive years of compensation that produce the largest earnings prior to reaching the service cap.
Required Employee Contributions	6.0% of base pay. Beginning July 1, 2012, 6.5% of base pay (7.0% for Park Police). Beginning July 1, 2014, 7% of base pay. Interest is credited at 4.5%.	3.0% of base pay up to the Social Security Wage Base (SSWB) plus 6.0% of base pay in excess of the SSWB. Beginning July 1, 2012, 3.5% of base pay up to SSWB plus 6.5% of base pay in excess of the SSWB. Beginning July 1, 2014, 4% of base pay up to the SSWB plus 7% of base pay in excess of the SSWB. Interest is credited at 4.5%.	8.0% of base pay. Beginning March 1, 2015, 8.5% of base pay. Beginning January 1, 2016, 9.0% of base pay. Interest is credited at 4.5%.	7.0% of base pay. Beginning March 1, 2015, 7.5% of base pay. Beginning January 1, 2016, 8.0% of base pay. Interest is credited at 4.5%.	4% of base pay up to wage base plus 8% of base pay in excess of the wage base. Interest is credited at 4.5%.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Plan A		Plan B	Plan C	Plan D	Plan E
Credited Service	Total period of years and months of completed service up to 40 years as credited under the terms and conditions of the System. Maximum Credited Service excludes sick leave credit. Effective 1/1/1994 part-time employees electing to participate in the ERS shall begin to accrue credited service based on actual hours worked divided by normal full-time hours for the class of work of the position the part-time employee occupies.		Generally, the same as Plan A, except no more than 35 years of service are counted. Maximum Credited Service excludes sick leave credit.	Generally, the same as Plan A, except no more than 30 years of service are counted. Maximum Credited Service excludes sick leave credit.	Generally, the same as Plan A, except no more than 32 years of service are counted. Maximum Credited Service excludes sick leave credit.	Same as Plan B.
Normal Retirement Benefit						
(a) Eligibility	*Non-Police* A member may retire and receive service retirement benefits after the earlier of: (1) Any age after completion of 30 years of Credited Service, or (2) Attainment of age 60 and completion of 5 years of Credited Service.	*Police* A member may retire and receive service retirement benefits after the earlier of: (1) Any age after completion of 25 years of Credited Service, or (2) Attainment of age 55 and completion of 5 years of Credited Service.	A member may retire and receive service retirement benefits after the earlier of: (1) Completion of 30 years of Credited Service, or (2) Attainment of age 60 and completion of 5 years of Credited Service.	A member may retire and receive service retirement benefits after the earlier of: (1) Completion of 25 years of Credited Service, or (2) Attainment of age 55 and completion of 5 years of Credited Service.	A member may retire and receive service retirement benefits after the earlier of: (1) Completion of 22 years of Credited Service, or (2) Attainment of age 55 and completion of 5 years of Credited Service.	A member may retire and receive service retirement benefits after the earlier of: (1) Completion of 30 years of Credited Service, or (2) Attainment of age 62 and completion of 10 years of Credited Service.
(b) Benefit	The annual retirement benefit is equal to 2% of Average Annual Earnings multiplied by years and months of Credited Service up to 40 years.		The annual retirement benefit is equal to 2.0% of Average Annual Earnings multiplied by years and months of Credited Service up to 35 years payable to Social Security Retirement Age. Upon attainment of Social Security Retirement Age, the annual retirement benefit changes to the sum of 1.5% of Average Annual Earnings up to Covered Compensation and 2.0% of Average Annual Earnings in excess of Covered Compensation multiplied by years and months of Credited Service up to 35 years.	The annual retirement benefit is equal to 2.4% of Average Annual Earnings multiplied by years and months of Credited Service up to 25 years, plus 2.0% of Average Annual Earnings multiplied by Credited Service in excess of 25 years, but not greater than 5 additional years.	The annual retirement benefit is equal to 2.27% of Average Annual Earnings multiplied by years and months of Credited Service not greater than 22 years (rounded to 50% upon reaching 22 years of service) plus 2.0% of Average Annual Earnings multiplied by years and months of Credited Service in excess of 22 years, but not greater than 10 additional years.	Same as Plan B.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Plan A		Plan B	Plan C	Plan D	Plan E
Normal Retirement Benefit (continued)						
(c) Maximum	100% of Average Annual Earnings.		100% of Average Annual Earnings.	70% of Average Annual Earnings.	100% of Average Annual Earnings.	100% of Average Annual Earnings.
Early Retirement Benefit-						
(a) Eligibility	*Non-Police* A member may retire and receive service retirement benefits after the earlier of: (1) Any age after completion of 25 years of Credited Service, or (2) Attainment of age 55 and completion of 15 years of Credited Service.	*Police* A member may retire and receive service retirement benefits after completion of 20 years of Credited Service.	A member may retire and receive service retirement benefits after the earlier of: (1) Completion of 25 years of Credited Service, or (2) Attainment of age 55 and completion of 15 years of Credited Service.	Completion of 20 years of Credited Service.	Completion of 20 years of Credited Service.	A member may retire and receive service retirement benefits after the earlier of: (1) Completion of 25 years of Credited Service, or (2) Attainment of age 57 and completion of 15 years of Credited Service.
(b) Benefit	The annual early retirement benefit is equal to the Normal Retirement Benefit reduced by 1/180th for each month that early retirement age precedes Normal Retirement Age.	Same as Non-Police.	Same as Plan A.	The annual early retirement benefit is equal to the Normal Retirement Benefit reduced by 1.0% per year for the first two years prior to Normal Retirement Date, 7.0% for the third year, 5.0% for the fourth year, and 6.0% for the fifth year. The reductions are prorated for partial years prior to Normal Retirement Date.	Same as Plan A.	Same as Plan A.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Plan A	Plan B	Plan C	Plan D	Plan E
Disability Retirement Benefit	None. (Members continue to accrue service until their Normal Retirement Date if qualified for Long Term Disability.)	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan A.
Service Related Death Benefit					
(a) Eligibility	Upon the death of an active member as a result of a service-related accident or illness. If the member is not married at time of death, the survivor's benefit will be paid to the member's surviving children.	Same as Plan A.	Upon the death of an active member with 10 years of Credited Service as a career Park Officer or as a result of a service-related accident or illness. If the member is not married at time of death, the survivor's benefit will be paid to the member's surviving children.	Same as Plan C.	Same as Plan A.
(b) Benefit	Upon the death of an active member the eligible survivor(s) shall receive a benefit equal to the Normal Retirement Benefit calculated on the basis that the deceased had continued as a member to his Normal Retirement Date at the rate of pay as of his last complete year of employment. This benefit shall not be lower than 25% of the member's final annual base pay. For part-time members, the final average base pay shall be the average base salary of the member or the 36 calendar month period, or for the 12 calendar month period, if greater.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan A.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Plan A	Plan B	Plan C	Plan D	Plan E
Non-Service Related Death Benefit–					
(a) Eligibility	Upon the death of an active member with 10 years of Credited Service as a result of a non-service related accident or illness. If the member is not married at time of death, the survivor's benefit will be paid to the member's surviving children.	Upon the death of an active member as a result of a nonservice-related accident or illness. If the member is not married at time of death, the survivor's benefit will be paid to the member's surviving children.	Upon the death of an active member with less than 10 years of Credited Service and as a result of a non-service-related accident or illness. If the member is not married at time of death the survivor's benefit will be paid to the member's surviving children.	Same as Plan C.	Same as Plan B.
(b) Benefit	Upon the death of an active member, the eligible survivor(s) shall receive a benefit equal to the Normal Retirement Benefit calculated on the basis that the deceased had continued as an active member to his Normal Retirement Date at a rate of pay as of his last complete year of employment. This benefit shall not be lower than 25% of the member's final annual base pay. For part-time members, the final average base pay shall be the average base salary of the member for the 36 calendar month period, or for the 12 calendar month period, if greater.	Effective July 1, 2018, upon the death of an active member: Non-vested - 25% of the member's final annual base pay or a lump sum of 50% of Average Annual Earnings plus contributions and interest. Vested (Prior to and Eligible for Early or Normal Retirement) - 25% of the member's final annual base pay or benefit paid had the deceased retired and selected a 100% Joint and Survivor option. For part-time member's, the final annual base pay shall be the average base salary of the member for the 36-calendar month period, or for the 12- month period, if greater.	Upon the death of an active member, the eligible survivor(s) shall receive a benefit equal to 25% of the member's final annual base pay. For part-time members, the final average base pay shall be the average base salary of the member for the 36-calendar month period, or for the 12 month period, if greater.	Same as Plan C.	Effective July 1, 2018, upon the death of an active member: Non-vested – For member's hired prior to October 1, 2018, 25% of the member's final annual base pay or a lump sum of 50% of Average Annual Earnings plus contributions and interest. For member's hired on or after October 1, 2018, a lump sum of 50% of Average Annual Earnings plus contributions and interest. Vested (Prior to and Eligible for Early or Normal Retirement) - For member's hired prior to October 1, 2018, 25% of the member's final annual base pay or benefit paid had the deceased retired and selected a 100% Joint and Survivor option. For member's hired on or after October 1, 2018, benefit paid had the deceased retired and selected a 100% Joint and Survivor option. For part-time member's, the final annual base pay shall be the average base salary of the member for the 60-calendar month period, or for the 12- month period, if greater.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Plan A	Plan B	Plan C	Plan D	Plan E
Ordinary Death Benefit					
(a) Eligibility	Upon the death of an active member (with no survivors eligible for a benefit) or a vested employee prior to commencement of benefits, the beneficiary shall be entitled to receive a death benefit.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan A.
(b) Benefit	The death benefit is equal to the sum of: (1) The member's contribution with interest to the date of death, and (2) 50% of the member's Average Annual Earnings.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan A.
Post-Retirement Death Benefit					
(a) Eligibility	Upon the death of a retired or disabled member, the beneficiary shall receive a death benefit.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan A.
(b) Benefit	The death benefit shall equal $10,000.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan A.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Plan A	Plan B	Plan C	Plan D	Plan E
Deferred Vested Benefit					
(a) Eligibility	If a member terminates employment with 5 years of Credited Service, he shall be eligible for a vested benefit.	Same as Plan A.	Same as Plan A.	Same as Plan A.	If a member terminates employment with 10 years of Credited Service, he shall be eligible for a vested benefit.
(b) Benefit	The vested benefit payable beginning at Normal Retirement Age (as if continued participation beyond termination) is the Normal Retirement Benefit multiplied by the appropriate vesting percentage.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan A.
(c) Vesting Schedule	**Credited Service** / **Vesting %** <5 / 0% 5 or more / 100%	Same as Plan A.	Same as Plan A.	Same as Plan A.	**Credited Service** / **Vesting %** <10 / 0% 10 or more / 100%
	Members who terminated prior to September 1, 2001, are vested as follows: **Credited Service** / **Vesting %** 5 / 50% 6 / 60% 7 / 70% 8 / 80% 9 / 90% 10 / 100%	Same as Plan A.	Same as Plan A.	Same as Plan A.	N/A
Withdrawal Benefit	A member who terminates prior to becoming eligible for a Deferred Vested Benefit is entitled to the refund of his contributions with interest. By accepting a Withdrawal Benefit, a member forfeits any Early or Deferred Vested Benefit to which he may otherwise be entitled.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Same as Plan A.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Plan A	Plan B	Plan C	Plan D	Plan E
Post Retirement Benefit	Retirement Benefits are increased annually by the percentage change in the Consumer Price Index – All Items Annual Average, Urban Index for Major US Cities. If the percentage change is greater than 3.0%, retirement benefits shall be adjusted by 3.0% plus one-half the percentage increase above 3.0%. The maximum adjustment for any one year is 5.0%. Effective July 1, 2012, the portion of an individual's retirement benefit attributed to Credited Service for periods on after July 1, 2012, will have a maximum adjustment of 2.5% for any one year. Effective July 1, 2012, benefits can no longer be decreased due to change in CPI.	Same as Plan A.	Same as Plan A.	Same as Plan A.	Retirement Benefits are increased annually by the percentage change in the Consumer Price Index – All Items Annual Average, Urban Index for Major US Cities. If the percentage increase in the Consumer Price Index for any year is 2.5% or less, the retirement benefits payable shall be adjusted by 100% of the increase. The maximum adjustment for any year is 2.5%.
Form of Payment					
(a) Normal Form	10 Year Certain and Life.	Life Annuity (with guaranteed return of contributions with interest)	Same as Plan A.	Same as Plan A.	Same as Plan B.
(b) Optional Forms	➢ Life Annuity ➢ Social Security Equalizer ➢ Joint and 50%, 75%, or 100% Survivor ➢ Joint and 50%, 75%, or 100% Survivor Popup ➢ Others, upon Board approval	➢ 10 Year Certain and Life ➢ Joint and 50%, 75%, or 100% Survivor ➢ Joint and 50%, 75%, 100% Survivor Popup ➢ Others, upon Board approval			

Changes in Plan Provisions

None.

APPENDIX D – GLOSSARY OF TERMS

1. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation; inflation; rates of investment earnings, and asset appreciation or depreciation; and other relevant items.

2. Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a Normal Cost and an Actuarial Liability.

3. Actuarial Gain/(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, as determined in accordance with a particular Actuarial Cost Method.

4. Actuarial Liability

The portion of the Actuarial Present Value of Projected Benefits which will not be paid by future Normal Costs. It represents the value of the past Normal Costs with interest to the valuation date.

5. Actuarial Present Value (Present Value)

The value as of a given date of a future amount or series of payments. The Actuarial Present Value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made. As a simple example: assume you owe $100 to a friend one year from now. Also, assume there is a 1% probability of your friend dying over the next year, in which case you won't be obligated to pay him. If the assumed investment return is 10%, the actuarial present value is:

Amount		Probability of Payment		1/(1+Investment Return)		
$100	x	(1 - .01)	x	1/(1+.1)	=	$90

6. Actuarial Valuation

The determination, as of a specified date, of the Normal Cost, Actuarial Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

APPENDIX D – GLOSSARY OF TERMS

7. Actuarial Value of Assets

The value of cash, investments and other property belonging to a pension plan as used by the actuary for the purpose of an Actuarial Valuation. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values. This way long-term costs are not distorted by short-term fluctuations in the market.

8. Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

9. Amortization Payment

The portion of the pension plan contribution which is designed to pay interest and principal on the Unfunded Actuarial Liability in order to pay for that liability in a given number of years.

10. Entry Age Normal Actuarial Cost Method

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages.

11. Funded Percentage

The ratio of the Actuarial Value of Assets to the Actuarial Liabilities.

12. Investment Return Assumption

The assumed interest rate used for projecting dollar related values in the future.

13. Mortality Table

A set of percentages which estimate the probability of death at a particular point in time. Typically, the rates are annual and based on age and sex.

14. Normal Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses, which is allocated to a valuation year by the Actuarial Cost Method.

APPENDIX D – GLOSSARY OF TERMS

15. Projected Benefits

Those pension plan benefit amounts which are expected to be paid in the future under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and increases in future compensation and service credits.

16. Unfunded Actuarial Liability

The excess of the Actuarial Liability over the Actuarial Value of Assets.