

Maryland State Retirement and Pension System

Actuarial Valuation Report
As of June 30, 2018



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November 20, 2018

Board of Trustees
Maryland State Retirement and Pension System
120 East Baltimore Street, 16th Floor
Baltimore, MD 21202

Dear Members of the Board:

The results of the **June 30, 2018 annual actuarial valuation** of the Maryland State Retirement and Pension System (“MSRPS”) are presented in this report.

This report was prepared at your request and is intended for use by the Maryland State Retirement Agency (“SRA”) and the Board of Trustees of the MSRPS and those designated or approved by the SRA or the Board. This report may be provided to other parties only in its entirety and only with the permission of the SRA or the Board. GRS is not responsible for unauthorized use of this report.

The purposes of the valuation are as follows:

- Measure the financial position of MSRPS with regard to funding,
- Provide the Board with State and Participating Governmental Unit (“PGU”) contribution rates for certification,
- Determine actuarial and statutory contribution rates with reinvested savings,
- Discuss some of the risks associated with achieving the funding objectives of MSRPS, and
- Analyze the aggregate experience of the State Systems over the past year.

Information required by Statements No. 67 and No. 68 of the Governmental Accounting Standards Board (“GASB”) for fiscal year 2018 is provided in a separate report.

The individual member data required for the valuations was furnished by the SRA, together with pertinent data on financial operations (unaudited). The cooperation and collaboration of SRA staff in furnishing these materials is acknowledged with appreciation. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the SRA.

Actuarial valuations are based upon assumptions regarding future activity in specific risk areas including the rates of investment return and payroll growth, eligibility for the various classes of benefits, and longevity among retired lives. The Board adopts these assumptions after considering the advice of the actuary and other professionals.

Each actuarial valuation takes into account all prior differences between actual and assumed experience in each risk area and adjusts the contribution rates as needed. GRS performed an experience study of MSRPS for the period 2010-2014 after completion of the June 30, 2014 valuations. Assumptions from the experience study including investment return, inflation, COLA increases, mortality rates, retirement rates, withdrawal rates, disability rates, and rates of salary increase were adopted by the Board for first use in the June 30, 2015 valuation. The Board adopted the use of an investment return assumption of 7.45% and an inflation assumption of 2.60% for first used in the June 30, 2018 valuation. It is our opinion that the actuarial assumptions used for the valuation remain reasonable.

New funding methodology set forth by Maryland legislation was first reflected in the June 30, 2015 valuation. The legislation removed the corridor funding method effective with the June 30, 2015 valuation.

The computed contribution rate shown on page I-2 may be considered as a minimum contribution rate that complies with the funding policy stated in the Statutes. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, we suggest that contributions to the System in excess of those presented in this report be considered. This report includes risk metrics on pages II-13 and II-14, but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This valuation assumes the continuing ability of the employer to make the contributions necessary to fund this system. A determination regarding whether or not the employer is actually able to do so is outside our scope of expertise. Consequently, we did not perform such an analysis.

The benefit provisions valued in the actuarial valuation as of June 30, 2018 are the same as the provisions from the last actuarial valuation as of June 30, 2017, with the exception of State Police and LEOPS. Portions of the savings from the 2011 pension reforms passed by the General Assembly are to be reinvested as additional contributions into the Systems. Legislation enacted in 2015 reduced the amount of reinvested savings to \$75 million per year beginning in fiscal year 2016 until the combined funded ratio of the Systems reaches 85% at which point the additional contributions cease.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. The actuary did not perform an analysis of the potential range of such future measurements in this actuarial valuation report.



This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. We certify that, to the best of our knowledge, this report is complete and accurate and has been prepared in accordance with Maryland's Annotated Code and generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice as promulgated by the Actuarial Standards Board.

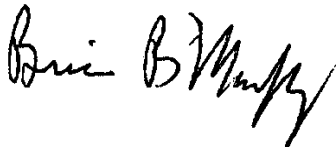
This report should not be relied on for any purpose other than the purposes previously described. Determinations of the financial values associated with benefits described in this report for a purpose other than the intended purpose may produce results that differ significantly from those presented in this report.

The signing actuaries are independent of the plan sponsor.

This is one of multiple documents comprising the actuarial report. Other documents comprising the actuarial report include the PowerPoint presentation presented to the Board in October 2018 and to the Joint Committee on Pensions in November. Not all of these documents have been issued as of this date.

Brian B. Murphy, Brad L. Armstrong, and Jeffrey T. Tebeau are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD



Brad L. Armstrong, ASA, EA, FCA, MAAA



Jeffrey T. Tebeau, FSA, EA, MAAA

BBM/BLA/JTT:sc

SECTION I

BOARD SUMMARY

Introduction

The funding valuation report presents the results of the June 30, 2018 annual actuarial valuation of the Maryland State Retirement and Pension System (MSRPS). The purposes of the annual funding valuations are as follows:

- Measure the financial position of MSRPS with regard to funding,
- Provide the Board with State and Participating Governmental Unit (“PGU”) contribution rates for certification,
- Determine actuarial and statutory contribution rates with reinvested savings,
- Discuss some of the risks associated with achieving the funding objectives of MSRPS, and
- Analyze the aggregate experience of the State Systems over the past year.

A summary of the primary funding valuation results as of June 30, 2018 is presented on the following page.

The Governmental Accounting Standards Board (GASB) No. 67 and No. 68 valuation report presents the results of the June 30, 2018 annual accounting valuation of the Maryland State Retirement and Pension System (MSRPS). The purpose of the annual accounting valuations is as follows:

- Provide actuarial reporting and disclosure information for the MSRPS and State’s financial report.

The accounting valuation results for the year ended June 30, 2018 are presented in a separate report.

Summary of Valuation Results

June 30, 2018

(\$ in Millions)
(State and Municipal)

	2018						2017		% Change
	State						Total	Total	
	TCS	ECS	Police	Judges	LEOPS	CORS ¹			
A. Demographic Information									
1. Active Number Counts	106,846	81,208	1,347	316	2,617	97	192,431	192,742	-0.2%
2. Active Payroll	\$ 6,941	\$ 4,301	\$ 100	\$ 47	\$ 171	\$ 5	\$ 11,566	\$ 11,419	1.3%
3. Retired Number Counts	77,201	78,287	2,477	421	1,954	34	160,374	156,366	2.6%
4. Annual Benefits for Retired Members ²	\$ 2,190	\$ 1,374	\$ 124	\$ 33	\$ 70	\$ 1	\$ 3,791	\$ 3,587	5.7%
5. Deferred / Inactive Number Counts	25,188	26,698	99	9	305	2	52,301	53,628	-2.5%
6. Total Number Counts	209,235	186,193	3,923	746	4,876	133	405,106	402,736	0.6%
B. Assets									
1. Market Value (MV)	\$ 31,480	\$ 17,429	\$ 1,447	\$ 470	\$ 977	\$ 24	\$ 51,827	\$ 48,987	5.8%
³ 2. Rate of Return on MV							8.05 %	9.95 %	
3. Actuarial Value (AV)	\$ 31,946	\$ 17,680	\$ 1,469	\$ 477	\$ 991	\$ 25	\$ 52,587	\$ 50,250	4.6%
4. Rate of Return on AV							6.83 %	6.96 %	
5. Ratio of AV to MV							101.5%	102.6%	
C. Actuarial Results									
1. Normal Cost as a % of Payroll	11.38%	10.24%	32.04%	39.18%	21.72%	13.63%	11.40%	11.42%	
2. Actuarial Accrued Liability (AAL)									
a. Active	\$ 17,054	\$ 9,034	\$ 460	\$ 179	\$ 495	\$ 12	\$ 27,234	\$ 26,869	1.4%
b. Retired	24,650	15,410	1,775	374	1,013	14	43,237	41,112	5.2%
c. Deferred/Inactive	1,036	1,018	16	4	31	0	2,105	2,005	5.0%
d. Total	\$ 42,740	\$ 25,462	\$ 2,251	\$ 557	\$ 1,539	\$ 26	\$ 72,575	\$ 69,987	3.7%
3. Unfunded AAL (UAAL)	\$ 10,794	\$ 7,783	\$ 782	\$ 80	\$ 549	\$ 1	\$ 19,988	\$ 19,736	1.3%
4. Funded Ratio	74.75 %	69.44 %	65.25 %	85.68 %	64.36 %	94.27 %	72.46 %	71.80 %	
D. Contribution Rates⁴									
	STATE PORTION ONLY								
	FY 2020						FY 2019	FY 2018	
	TCS	ECS	State			Total	Total	Total	
			Police	Judges	LEOPS				
1. Pension Contributions									
a. Employer Normal Cost	4.38%	3.85%	24.04%	32.49%	15.07%	4.65%	4.66%	4.69%	
b. Member Contribution Rate	7.00%	6.74%	8.00%	6.69%	7.00%	6.93%	6.93%	6.92%	
c. UAAL Contribution Rate	<u>11.21%</u>	<u>15.71%</u>	<u>55.54%</u>	<u>11.95%</u>	<u>26.30%</u>	<u>13.17%</u>	<u>12.76%</u>	<u>12.91%</u>	
d. Total	22.59%	26.30%	87.58%	51.13%	48.37%	24.75%	24.35%	24.52%	
2. Total Actuarial Employer Rate (1.a + 1.c)	15.59%	19.56%	79.58%	44.44%	41.37%	17.82%	17.42%	17.60%	
3. Total Employer Budgeted Rate									
a. Employer Budgeted Rate	15.59%	19.56%	79.58%	44.44%	41.37%	17.82%	17.42%	17.60%	
b. Reinvested Savings Rate	<u>0.71%</u>	<u>0.66%</u>	<u>1.00%</u>	<u>0.00%</u>	<u>1.03%</u>	<u>0.72%</u>	<u>0.73%</u>	<u>0.74%</u>	
c. Total Employer Budgeted Rate	16.30%	20.22%	80.58%	44.44%	42.40%	18.54%	18.15%	18.34%	

¹Includes CORS Municipal only. State CORS included in ECS.

²Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018 and July 1, 2017, respectively.

³Actuarial estimation method used is expected to produce results that differ modestly from figures reported by State Street.

⁴Contribution rates shown in the "Total" column are for informational purposes only and are not used for funding purposes. Totals may not add due to rounding.

Actuary's Comments

For the year ended June 30, 2018, the System's assets earned **8.05%** based on our estimate and **8.06%** as reported by State Street (using a slightly different computation method) on a market value basis and **6.83%** on a smoothed or actuarial value basis. The smoothed rate of return is less than the 7.50% assumed rate of investment return. Recognized asset losses from fiscal years 2015 and 2016 offset recognized asset gains from fiscal years 2014, 2017 and 2018 in the actuarial value of assets as of June 30, 2018. This resulted in a loss under the asset smoothing method.

UAAL and Actuarial Gain/(Loss) (\$ in Millions)

	Municipal	State	Total SRPS
Unfunded Actuarial Accrued Liability (UAAL) as of June 30, 2017	\$ 882	\$ 18,854	\$ 19,736
Expected UAAL as of June 30, 2018 before changes	882	18,815	19,697
Changes in benefit provisions	2	1	3
Changes in methods and assumptions	14	140	154
Expected UAAL as of June 30, 2018 after changes	898	18,956	19,854
Actual UAAL as of June 30, 2018	950	19,038	19,988
Net actuarial gain/(loss)	(52)	(82)	(134)
Actuarial gain/(loss) by source			
Actuarial investment experience	(29)	(305)	(334)
Actuarial accrued liability experience	(23)	223	200

Totals may not add due to rounding.

Changes in benefit provisions included increasing the cap on retirement allowances for LEOPS members (from 60% of average final compensation to 65%) and extending the length of time a State Police member may participate in the Deferred Retirement Option Plan (DROP) by one year. Changes in assumptions included reducing the assumed rate of investment return to 7.45% and price inflation to 2.60%.

In relative terms, the overall System funded ratio of actuarial value of assets to liabilities increased from 71.80% in 2017 to **72.46%** this year. If market value of assets were the basis for the measurements, the funded ratio would have increased from 70.00% to 71.41% funded.

The market value of assets exceeds the retiree liabilities by about 20% in total (or 2.5% if accumulated member contributions of about \$7.5 billion are netted out), an increase from 19% last year. This is referred to as a short condition test and is demonstrated in the chart at the bottom of this page. It is looking at the current retiree liabilities as the benefits that will be paid the soonest since these benefits are already in pay status. Active liabilities and deferred vested liabilities do not have associated immediate cash flow requirements. Although the market value of assets exceeds the current retiree liabilities in total, this is not true for two of the smaller systems. For State Police and LEOPS, the market value of assets is less than the retiree liabilities.

(\$ in Millions)

Short Condition Test	TCS	ECS	State Police	Judges	LEOPS	CORS	Total
Market Value of Assets (MVA)	\$ 31,480	\$ 17,429	\$ 1,447	\$ 470	\$ 977	\$ 24	\$ 51,827
Retiree Liability	24,650	15,410	1,775	374	1,013	14	43,237
MVA as % of Retiree Liability	128%	113%	81%	126%	96%	178%	120%

Actuary's Comments

In the 2013 legislative session, the Legislature changed the method used to fund the State Systems of the MSRPS. The unfunded liability for each State System is being amortized over a single closed 25-year period beginning July 1, 2014 and ending June 30, 2039 (20 years remaining as of the June 30, 2018 valuation, which determines the fiscal year 2020 contribution). In addition, the corridor method used by the Teachers' Combined System and the State portion of the Employees' Combined System, which was established in 2001, was being phased-out over a 10-year period. In 2015, the Legislature removed the corridor funding method effective with the June 30, 2015 valuation.

The Teachers' Combined System (TCS) remained out of the corridor since the June 30, 2005 valuation and the State portion of the Employees Combined System (ECS) remained out of the corridor since the June 30, 2004 valuation resulting in contribution rates for TCS and ECS that were less than actuarial rates. With the elimination of the corridor effective with the June 30, 2015 valuation report, TCS and ECS began to contribute based on the actuarially determined rate beginning in fiscal year 2017.

Beginning in fiscal year 2012, employers pay a per-member fee to cover the Retirement Agency's operating expenses (i.e., administrative expenses). The State pays the fee for libraries.

In 2011, the General Assembly enacted pension reforms which were effective July 1, 2011, and affected both current actives and new hires. The member contribution rate was increased for members of the Teachers' Pension System and Employees' Pension System from 5% to 7%. The member contribution rate was increased from 4% to 7% for LEOPS. In addition, the benefit attributable to service on or after July 1, 2011 is subject to cost-of-living adjustments (COLAs) that are based on the increase in the Consumer Price Index and capped at 2.5% or 1.0%. The cap is 2.5% if market value investment return from the preceding calendar year was higher or lower than the investment return assumption used in the valuation (currently 7.45%), and 1.0% otherwise. There were also that affected only those members hired on or after July 1, 2011.

In addition to the benefit provision changes, a portion of the savings from the pension reforms is to be reinvested in certain State Systems (TCS, ECS, State Police, and LEOPS). Reinvested savings of \$191 million was contributed in fiscal year 2013. Legislation enacted in 2014 changed the amount of reinvested savings from \$300 million each year beginning in fiscal year 2014 to \$100 million each year for fiscal years 2014 and 2015, \$150 million for fiscal year 2016, \$200 million for fiscal year 2017, \$250 million for fiscal year 2018, \$300 million each year beginning in fiscal year 2019 and thereafter. The \$300 million would then continue until the later of the combined funded ratio of the Systems reaching 85%, and the corridor funding method being fully phased-out. Legislation enacted in 2015 further reduced the amount of reinvested savings to \$75 million per year beginning in fiscal year 2016 until the combined funded ratio of the Systems reaches 85% at which point the reinvestment ceases. The allocation of reinvested savings by System is in proportion to the savings from the pension reforms as measured in the actuarial valuation as of June 30, 2011.

The actuarially determined rates are equal to the employer normal cost plus the Unfunded Actuarial Accrued Liability contribution rate. The unfunded actuarial contribution rate is equal to the payment resulting from amortizing the remaining unfunded liability as a level percentage of pay over a single 25-year closed period beginning July 1, 2014 and ending June 30, 2039 (20 years remaining as of the June 30, 2018 valuation).

Actuary's Comments

The fiscal year 2020 budgeted rates for TCS, ECS, State Police, and LEOPS are equal to the actuarially determined rate. The budgeted rates with reinvested savings are based on a projection of payroll. It is our understanding that the Retirement Agency will monitor contributions to ensure that the System receives the proper amount of reinvested dollar savings during fiscal year 2020. The fiscal year 2020 budgeted rate for Judges is equal to the actuarially determined contribution rate.

Beginning in fiscal year 2013, local employers contributed a portion of the statutory normal cost contribution for the Teachers Combined System. The required portion of normal cost contribution amounts for local employers for fiscal years 2013 through 2016 was defined by the Maryland statutes. Beginning in fiscal year 2017, local employers contribute the full normal cost contribution on behalf of their employees.

The schedules required under Government Accounting Standards Board (GASB) Statement No. 67 (beginning with fiscal year 2014) and No. 68 (beginning with fiscal year 2015) are provided in a separate report.

Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected System Contributions and Funded Status

Given the System's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the System earning 7.45% on the actuarial value of assets), it is expected that:

- (1) The employer normal cost as a percentage of pay will decrease to the level of the Reformed Benefit Plan's (i.e., plans for members hired after July 1, 2011) normal cost as time passes and the active population is comprised entirely of Reformed Plan members,
- (2) The unfunded actuarial accrued liabilities will be fully amortized after 20 years (June 30, 2039), and
- (3) The funded status of the plan will increase gradually towards a 100% funded ratio.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the Actuarial Accrued Liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of System assets to cover the estimated cost of settling the System's benefit obligations, for example, transferring the liability to an unrelated third party in a free market type transaction.
- (2) The measurement is dependent upon the actuarial cost method which, in combination with the System's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the System would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- (3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

Prior Year Asset Experience

ASSETS (STATE AND MUNICIPAL)

Plan assets for this System are measured on both a market value and an actuarial or smoothed value basis. The actuarial smoothing method, described again on page Appendix A-17, annually recognizes 20% of the difference between (a) the expected investment return if the market value of assets had earned the assumed rate of 7.50% during FY 2018, and (b) the actual investment return. Bear in mind that the expected return for this purpose is based on the assumed return from the prior year's actuarial valuation. In addition, there is a market value collar that constrains the actuarial value to be within 20% of the market value of assets. In periods of high returns, this method defers the amount of asset gains above the assumed return (7.50%). Conversely, in periods of returns below the assumed rate, recognition of the losses is deferred. This method limits the effect of temporary asset value fluctuations on contribution rates. The System does not immediately feel the full impact of lower (or higher) costs when asset values fluctuate dramatically.

For the year ended June 30, 2018, the System's assets earned **8.05%** based on our estimate and **8.06%** as reported by State Street (using a slightly different computation method) on a market value basis and **6.83%** on an actuarial value basis. The System experienced an investment gain of **\$264** million on a market value basis and a loss of **\$334** million on an actuarial basis. More detail can be found in Section III. Reconciliations of market value and actuarial value of assets are presented below:

(STATE AND MUNICIPAL)
(\$ in Millions)

	Market Value	Actuarial Value
June 30, 2017 Value	\$ 48,987	\$ 50,250
June 30, 2017 Municipal Withdrawals / New Entrants	-	-
Employer Contributions	1,995	1,995
Member Contributions	792	792
Benefit Payments and Other Disbursements	(3,846)	(3,846)
Expected Investment Earnings (7.50% in FY2018)	3,635	3,730
Expected Value June 30, 2018	\$ 51,563	\$ 52,921
Investment Gain/(Loss)	264	(334)
June 30, 2018 Value	\$ 51,827	\$ 52,587

Figures may not add exactly due to rounding

Trends (State and Municipal)

One of the best ways to measure or evaluate the financial condition of a pension plan is to examine the historical trends that are evolving. Below are three charts which illustrate trend information from 1993 through the end of 2018, on the System's assets and liabilities, annual cash flows in and out of the fund, and the State contribution rate. Our comments on each follow.

Chart A: Assets/Liabilities

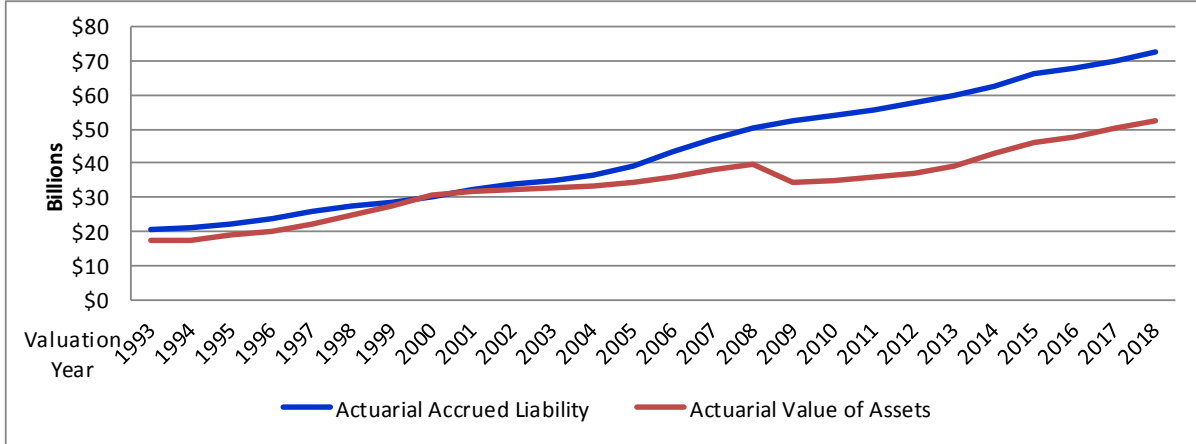


Chart B: Benefits vs. Contributions

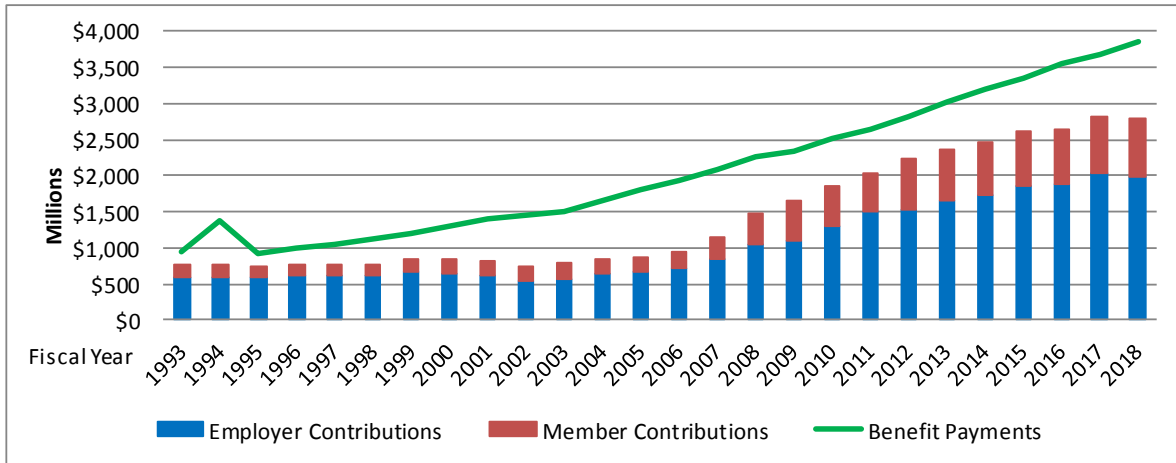
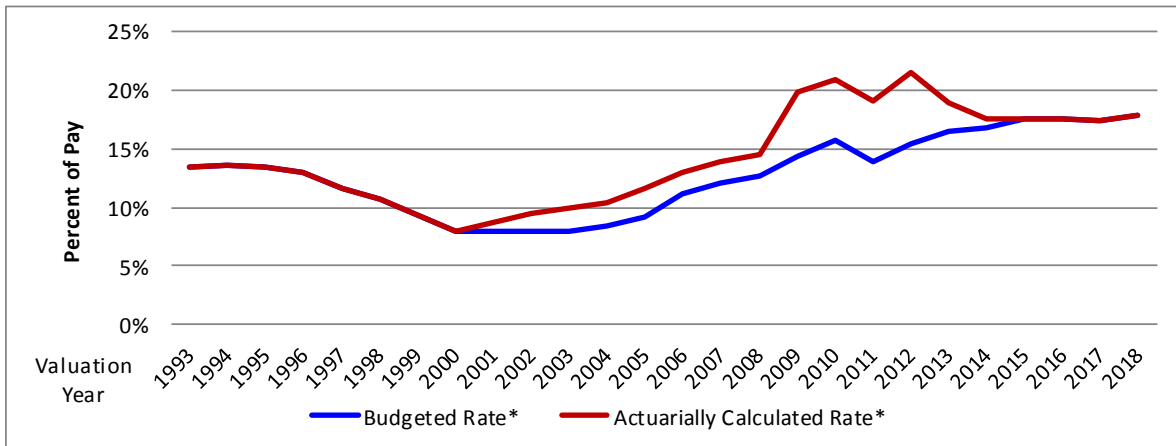


Chart C: State Contribution Rate



* Excludes reinvested savings in valuation years after 2010. 2010 rates are prior to the 2011 GA Reforms.

Trends (State and Municipal)

Chart A displays a comparison of the actuarial value of assets and the Actuarial Accrued Liability (AAL). The difference between the actuarial value of assets and the AAL is the Unfunded Actuarial Accrued Liability. The Unfunded Actuarial Accrued Liability is about \$20 billion as of June 30, 2018, and increased by about \$252 million since the last valuation as of June 30, 2017. As of June 30, 2018, the actuarial value of assets under the five-year asset smoothing method is 101% of the market value of assets, compared with 103% as of June 30, 2017.

Chart B presents non-investment cash flow trend information that can have investment implications. With the aging and retirements of the baby boom generation, MSRPS has seen increases in payments to retirees. This is expected for mature retirement systems such as MSRPS. Benefit payments, which are the total amount below the green line, exceeds the total contributions, which is the total amount below the top of the red bar. The amount needed to pay the excess of benefit payments over total contributions comes from either investment return or liquidation of current assets. If the difference between the total benefit payments and total contributions increases, a larger portion of investment return will be needed to pay benefits and may require a change in asset allocation. The corridor method increased the extent of negative cash flows. The corridor funding method was eliminated first effective with the June 30, 2015 valuation. The budgeted rates have been equal to the actuarial rates since fiscal year 2017.

Finally, Chart C looks at the composite actuarially determined and budgeted State contribution rates. The budgeted contribution rates by System determine the fiscal year State appropriation. It shows the impact of the 1990s sustained investment gains and a continuous lowering of the rate until 2000. Effective with the 2001 valuation, the State appropriations were performed under a corridor funding method for the two largest plans, TCS and ECS. The appropriation remained essentially level for a few years before increasing with the 2004 valuation. Legislation enacted in 2015 removed the corridor funding method for TCS and ECS beginning with the valuation as of June 30, 2015. The budgeted rate is now equal to the actuarial rate for TCS and ECS.

Chart C further illustrates that the corridor method consistently acted to reduce the State's contributions calculated in valuations between 2001 and 2015.

SECTION II

VALUATION RESULTS

State Systems (Excludes Municipalities) Valuation Results

The combined State System's (excluding PGU's) Unfunded Actuarial Accrued Liability increased by \$184 million, from \$18,854 million as of June 30, 2017, to \$19,038 million as of June 30, 2018. There was an expected decrease in the Unfunded Actuarial Accrued Liability of \$39 million, if all actuarial assumptions had been realized. The unfunded liability is expected to decline under the current amortization policy

There was an increase in the Unfunded Actuarial Accrued Liability of \$82 million due to unfavorable plan experience. The net loss due to plan experience of \$82 million is comprised of demographic gains on the liabilities of \$223 million and an asset loss (on the actuarial value of assets) of \$305 million. There was an increase in the Unfunded Actuarial Accrued Liability of \$140 million due to changes in economic assumptions.

In 2018, the General Assembly raised the cap on retirement allowances for LEOPS members from 60% of average final compensation to 65%. This change increased the Unfunded Actuarial Accrued Liability by \$2.9 million. Also in 2018, the General Assembly extended the length of time a State Police member may participate in the Deferred Retirement Option Plan (DROP) by one year. This change decreased the Unfunded Actuarial Accrued Liability by \$2.1 million.

The combined State System's market value of assets earned 8.05%¹ for the year ended June 30, 2018, which is more than the 7.50% assumed rate of investment return. The actuarial, or smoothed, rate of return measured from this past year was 6.83%, which fell short of the assumed rate of return on the actuarial value of assets, producing an asset loss. Partial recognition of asset gains from FY 2014, 2017 and 2018 combined with losses from FY 2015 and 2016 were recognized in the actuarial value of assets as of June 30, 2018, under the asset smoothing method, resulting in a recognized asset loss of \$305 million. Reconciliations of market value and actuarial value of assets are presented below:

**(STATE Only)
(\$ in Millions)**

	Market Value	Actuarial Value
June 30, 2017 Value	\$ 44,714	\$ 45,869
Employer Contributions	1,879	1,879
Member Contributions	724	724
Benefit Payments and Other Disbursements	(3,574)	(3,574)
Expected Investment Earnings (7.50% in FY2018)	3,318	3,404
Expected Value June 30, 2018	\$ 47,062	\$ 48,302
Investment Gain/(Loss)	241	(305)
June 30, 2018 Value	\$ 47,302	\$ 47,997

Figures may not add exactly due to rounding

There were liability gains due to lower retiree COLA increases on average than assumed. COLA increases of 2.13% were granted to eligible retirees who have a COLA cap of 3.00%, 5.00%, no COLA cap, and reformed cap compared to the actuarial assumptions of 2.26%, 2.63%, 2.65%, and 1.47%, respectively. All of the State Systems experienced gains on active member liabilities as well, caused mainly by actual increases in salaries that were less than assumed.

¹ The actuarially computed rate of return, excluding municipalities.

State Systems (Excludes Municipalities) Valuation Results

The combined State System funded ratio increased from 70.9% at June 30, 2017 to 71.6% at June 30, 2018.

The actuarially determined contribution rates increased for each System, except Judges, from those calculated in the June 30, 2017 valuation to those calculated in the June 30, 2018 valuation, which determines the FY2019 and FY2020 contributions, respectively.

A reconciliation of the actuarial contribution rate (excluding reinvested savings) is shown below:

	(STATE ONLY)					
	Teachers' Combined System	Employees' Combined System	State Police	Judges	LEOPS	Total
FY 2019 Actuarial Contribution Rate	15.43%	18.58%	78.41%	44.53%	39.78%	17.42%
Change due to Investment Return	0.21%	0.19%	0.72%	0.52%	0.34%	0.21%
Change due to Demographic and Non-Inv. Exp.	-0.16%	-0.11%	-1.34%	-0.79%	0.25%	-0.16%
Change due to Benefit Provisions	0.00%	0.00%	-0.22%	0.00%	0.29%	0.00%
Change due to Assumption Changes	0.16%	0.15%	0.29%	-0.05%	0.32%	0.16%
Change due to Total Payroll Experience	0.09%	0.73%	1.74%	0.22%	0.58%	0.27%
Change due to Other	<u>-0.14%</u>	<u>0.01%</u>	<u>-0.02%</u>	<u>0.02%</u>	<u>-0.19%</u>	<u>-0.09%</u>
FY 2020 Actuarial Contribution Rate	15.59%	19.56%	79.58%	44.44%	41.37%	17.82%

Totals may not add due to rounding.

Each System saw an increase in the contribution rates due to unfavorable economic experience and assumption changes. Overall, this was offset by favorable demographic experience.

The normal cost rate decreased slightly for most Systems as a result of more active members being covered under the benefit provisions of the reformed benefit plans. State Police and LEOPS had changes in benefit provisions, which decreased the contribution rate for State Police and increased the contribution rate for LEOPS.

In addition, the increase in total payroll was lower than expected under the actuarial assumptions (3.15% in FY2018) for all the State Systems. Total payroll increased by 2.4% for TCS, 1.3% for Judges and 0.9% for LEOPS. Total payroll decreased by 1.6% for ECS and 0.1% for State Police. Total payroll growth that was lower than assumed puts upward pressure on the contribution rates because the unfunded liability contribution is spread over a smaller payroll base. This is a contributing reason why the State Systems saw a slight increase in their contribution rate for FY2020.

Funded ratios are expected to progress toward 100% at a slightly lower rate than a static amortization schedule of the current unfunded actuarial accrued liabilities as the deferred investment losses from FY2015 and FY2016 are recognized in the actuarial value of assets.

Summary of Valuation Results by System as of June 30, 2018 (State and Municipal)

State Sponsored Plans	Employees				LEOPS	Total State*	
	Teachers	(State)	State Police	Judges	(State)		
Actuarial Liability - Active Members	\$ 17,053,853,231	\$ 6,960,853,930	\$ 459,788,246	\$ 178,631,002	\$ 309,730,250	\$ 24,962,856,659	
Actuarial Liability - Retirees, Term. Vested, & Inactives	<u>25,685,708,501</u>	<u>13,434,607,139</u>	<u>1,790,910,673</u>	<u>378,115,428</u>	<u>782,971,064</u>	<u>42,072,312,805</u>	
Total Actuarial Liability	\$ 42,739,561,732	\$ 20,395,461,069	\$ 2,250,698,919	\$ 556,746,430	\$ 1,092,701,314	\$ 67,035,169,464	
Actuarial Value of Assets	<u>31,945,910,198</u>	<u>13,409,959,183</u>	<u>1,468,640,940</u>	<u>477,005,959</u>	<u>695,528,805</u>	<u>47,997,045,086</u>	
Unfunded Actuarial Accrued Liability (UAAL)	10,793,651,534	6,985,501,886	782,057,979	79,740,471	397,172,509	19,038,124,378	
Funded Ratio	74.75%	65.75%	65.25%	85.68%	63.65%	71.60%	
Active Member Payroll	\$ 6,941,096,601	\$ 3,165,587,514	\$ 100,324,842	\$ 47,498,152	\$ 107,729,522	\$ 10,362,236,631	
UAAL as a Percent-of-Payroll	155.5%	220.7%	779.5%	167.9%	368.7%	183.7%	
<i>Before Reinvested Savings</i>							
Employer Normal Cost Contribution	4.38%	3.85%	24.04%	32.49%	15.07%	4.65%	
UAAL Contribution	<u>11.21%</u>	<u>15.71%</u>	<u>55.54%</u>	<u>11.95%</u>	<u>26.30%</u>	<u>13.17%</u>	
Total Employer Contribution Without Reinvested Savings	15.59%	19.56%	79.58%	44.44%	41.37%	17.82%	
<i>After Reinvested Savings</i>							
Total Employer Contribution Without Reinvested Savings	15.59%	19.56%	79.58%	44.44%	41.37%	17.82%	
Reinvested Savings Rate	<u>0.71%</u>	<u>0.66%</u>	<u>1.00%</u>	<u>0.00%</u>	<u>1.03%</u>	<u>0.72%</u>	
Total Employer Contribution With Reinvested Savings	16.30%	20.22%	80.58%	44.44%	42.40%	18.54%	
Municipal Plans							
	Employees		LEOPS		CORS	Total Municipal	
	(Municipal)		(Municipal)		(Municipal)		
Actuarial Liability - Active Members	\$ 2,073,389,522		\$ 184,946,526		\$ 12,311,826	\$ 2,270,647,874	
Actuarial Liability - Retirees, Term. Vested, & Inactives	<u>2,993,646,240</u>		<u>261,520,489</u>		<u>13,704,695</u>	<u>3,268,871,424</u>	
Total Actuarial Liability	\$ 5,067,035,762		\$ 446,467,015		\$ 26,016,521	\$ 5,539,519,298	
Actuarial Value of Assets	<u>4,269,928,713</u>		<u>295,035,407</u>		<u>24,526,829</u>	<u>4,589,490,949</u>	
Unfunded Actuarial Accrued Liability (UAAL)	797,107,049		151,431,608		1,489,692	950,028,349	
Funded Ratio	84.27%		66.08%		94.27%	82.85%	
Active Member Payroll	\$ 1,135,659,976		\$ 62,825,559		\$ 5,497,631	\$ 1,203,983,166	
UAAL as a Percent-of-Payroll	70.2%		241.0%		27.1%	78.9%	
State and Municipal Sponsored Plans							
	Teachers	Employees	State Police	Judges	LEOPS	CORS	Total SRPS
Actuarial Liability - Active Members	\$ 17,053,853,231	\$ 9,034,243,452	\$ 459,788,246	\$ 178,631,002	\$ 494,676,776	\$ 12,311,826	\$ 27,233,504,533
Actuarial Liability - Retirees, Term. Vested, & Inactives	<u>25,685,708,501</u>	<u>16,428,253,379</u>	<u>1,790,910,673</u>	<u>378,115,428</u>	<u>1,044,491,553</u>	<u>13,704,695</u>	<u>45,341,184,229</u>
Total Actuarial Liability	\$ 42,739,561,732	\$ 25,462,496,831	\$ 2,250,698,919	\$ 556,746,430	\$ 1,539,168,329	\$ 26,016,521	\$ 72,574,688,762
Actuarial Value of Assets	<u>31,945,910,198</u>	<u>17,679,887,896</u>	<u>1,468,640,940</u>	<u>477,005,959</u>	<u>990,564,212</u>	<u>24,526,829</u>	<u>52,586,536,035</u>
Unfunded Actuarial Accrued Liability (UAAL)	10,793,651,534	7,782,608,935	782,057,979	79,740,471	548,604,117	1,489,692	19,988,152,727
Funded Ratio	74.75%	69.44%	65.25%	85.68%	64.36%	94.27%	72.46%
Active Member Payroll	\$ 6,941,096,601	\$ 4,301,247,490	\$ 100,324,842	\$ 47,498,152	\$ 170,555,081	\$ 5,497,631	\$ 11,566,219,797
UAAL as a Percent-of-Payroll	155.5%	180.9%	779.5%	167.9%	321.7%	27.1%	172.8%

* Contribution rates shown in the "Total" column are for informational purposes only and are not used for funding purposes.

Calculation of State Contribution Rates and Illustrated State Contributions (Including Reinvested Savings)

	Teachers	Employees (State)	State Police	Judges	LEOPS (State)	Total State
Percentage of Total Pension Reform Savings*	67.7%	29.4%	1.4%	0.0%	1.5%	100.0%
Reinvested Savings	\$ 50,772,568	\$ 22,019,803	\$ 1,050,207	\$ -	\$ 1,157,423	\$ 75,000,000
FY 2020 Contributions						
Employer Normal Cost Contribution	4.38%	3.85%	24.04%	32.49%	15.07%	4.65%
UAAL Contribution	11.21%	15.71%	55.54%	11.95%	26.30%	13.17%
Total Actuarial Employer Contribution	<u>15.59%</u>	<u>19.56%</u>	<u>79.58%</u>	<u>44.44%</u>	<u>41.37%</u>	<u>17.82%</u>
Total Employer Contribution	15.59%	19.56%	79.58%	44.44%	41.37%	17.82%
Reinvested Saving Rate	<u>0.71%</u>	<u>0.66%</u>	<u>1.00%</u>	<u>0.00%</u>	<u>1.03%</u>	<u>0.72%</u>
Estimated Total Employer Contribution	16.30%	20.22%	80.58%	44.44%	42.40%	18.54%
Projected Payroll	\$ 7,156,270,596	\$ 3,313,922,305	\$ 105,025,917	\$ 49,723,846	\$ 112,777,570	\$ 10,737,720,234
Illustrated Contribution Dollars						
Local Employers' Portion	\$ 288,577,069					\$ 288,577,069
State Portion	827,085,517	\$ 648,203,203	\$ 83,579,625	\$ 22,097,277	# \$ 46,656,081	1,627,621,703
Dollar Reinvested Savings	<u>50,772,568</u>	<u>22,019,803</u>	<u>1,050,207</u>	<u>-</u>	<u>1,157,423</u>	<u>75,000,000</u>
Total Illustrated Contribution Dollars	\$ 1,166,435,154	\$ 670,223,006	\$ 84,629,832	\$ 22,097,277	\$ 47,813,504	\$ 1,991,198,772

*Reinvested savings allocated among the State systems based on their proportionate share of the total savings measured as of June 30, 2011. The allocation percentages do not change.

Summary of State Contributions – Including Reinvested Savings (State Portion Only)

		Teachers' Combined	Employees' Combined	State Police	Judges	LEOPS	Total State#
7/1/2018 Valuation Results (FY 2020)	Unfunded Actuarial Liability	\$ 10,793,651,534	\$ 6,985,501,886	\$ 782,057,979	\$ 79,740,471	\$ 397,172,509	\$ 19,038,124,378
	Illustrated Contribution Dollars	\$ 1,166,435,154	\$ 670,223,006	\$ 84,629,832	\$ 22,097,277	\$ 47,813,504	\$ 1,991,198,772
	Local Employers' Portion	288,577,069	NA	NA	NA	NA	\$ 288,577,069
	State Portion	\$ 877,858,085	\$ 670,223,006	\$ 84,629,832	\$ 22,097,277	\$ 47,813,504	\$ 1,702,621,703
	Projected Payroll	\$ 7,156,270,596	\$ 3,313,922,305	\$ 105,025,917	\$ 49,723,846	\$ 112,777,570	\$ 10,737,720,234
	Total Contributions as Percentage of Payroll	16.30%	20.22%	80.58%	44.44%	42.40%	18.54%
7/1/2017 Valuation Results (FY 2019)	Unfunded Actuarial Liability	\$ 10,698,112,951	\$ 6,901,382,233	\$ 789,583,033	\$ 82,767,923	\$ 382,526,858	\$ 18,854,372,998
	Illustrated Contribution Dollars	\$ 1,130,013,851	\$ 648,512,828	\$ 83,509,575	\$ 21,867,734	\$ 45,676,506	\$ 1,929,580,493
	Local Employers' Portion	283,815,618	NA	NA	NA	NA	\$ 283,815,618
	State Portion	\$ 846,198,233	\$ 648,512,828	\$ 83,509,575	\$ 21,867,734	\$ 45,676,506	\$ 1,645,764,875
	Projected Payroll	\$ 6,994,434,760	\$ 3,371,867,733	\$ 105,164,352	\$ 49,107,868	\$ 111,913,231	\$ 10,632,487,944
	Total Contributions as Percentage of Payroll	16.16%	19.23%	79.41%	44.53%	40.81%	18.15%

Contribution rates shown in the "Total" column are for informational purposes only and are not used for funding purposes.

State Budgeted Contribution Rates by System for the Fiscal Years 2000 to 2020 (State Portion Only)

Valuation Date June 30,	Fiscal Year	Teachers' Combined	Employees' Combined	State Police	Judges	LEOPS	Total State*
2018	2020 @	16.30%	20.22%	80.58%	44.44%	42.40%	18.54%
2018	2020 #	15.59%	19.56%	79.58%	44.44%	41.37%	17.82%
2017	2019 @	16.16%	19.23%	79.41%	44.53%	40.81%	18.15%
2017	2019 #	15.43%	18.58%	78.41%	44.53%	39.78%	17.42%
2016	2018 @	16.45%	19.22%	81.36%	46.45%	40.77%	18.34%
2016	2018 #	15.71%	18.56%	80.29%	46.45%	39.69%	17.60%
2015	2017 @	16.55%	18.93%	82.50%	46.56%	40.72%	18.32%
2015	2017 #	15.79%	18.28%	81.40%	46.56%	39.60%	17.58%
2014	2016 @^	16.49%	17.04%	80.08%	40.70%	40.95%	17.58%
2014	2016 @	17.27%	17.70%	81.24%	40.70%	42.14%	18.32%
2014	2016 #	15.71%	16.38%	78.91%	40.70%	39.77%	16.83%
2013	2015 @^	16.53%	16.45%	84.73%	42.74%	43.10%	17.44%
2013	2015 @	18.64%	18.30%	88.06%	42.74%	46.56%	19.48%
2013	2015 #	15.47%	15.53%	83.06%	42.74%	41.37%	16.41%
2012	2014 @	17.94%	16.84%	71.85%	50.92%	57.72%	18.54%
2012	2014 #	14.71%	14.05%	66.71%	50.92%	52.47%	15.43%
2011	2013 @	15.30%	14.05%	64.57%	61.18%	50.14%	15.80%
2011	2013 #	13.29%	12.29%	61.21%	61.18%	46.81%	13.85%
2010	2012	15.45%	13.40%	61.01%	60.37%	49.26%	15.67%
2009	2011	14.34%	11.69%	57.03%	59.07%	47.67%	14.33%
2008	2010	13.15%	9.93%	30.79%	48.89%	38.63%	12.62%
2007	2009	11.70%	8.73%	20.53%	43.61%	36.99%	11.14%
2006	2008	11.60%	8.86%	15.44%	44.12%	41.74%	11.10%
2005	2007	9.71%	6.83%	13.83%	42.43%	40.60%	9.18%
2004	2006	9.35%	5.76%	8.22%	41.12%	38.47%	8.46%
2003	2005	9.35%	4.73%	0.00%	36.72%	37.73%	7.97%
2002	2004	9.35%	4.73%	7.58%	43.74%	35.13%	7.98%
2001	2003	9.35%	4.73%	5.78%	43.92%	36.10%	7.98%
2000	2002	9.35%	4.73%	5.83%	42.66%	32.41%	7.98%

* Contribution rates shown in the "Total" column are for informational purposes only and are not used for funding purposes.

@ Includes effect of reinvested savings.

Excludes effect of reinvested savings.

^ Reflects the reduction of reinvested savings passed by the General Assembly from \$300 million to \$100 million for FY 2015 and from \$150 million to \$75 million beginning FY 2016.

Detailed Actuarial Information

Teachers' Combined System

	Actuarial Valuation Performed		% Change
	June 30, 2018 (for FY 2020)	June 30, 2017 (for FY 2019)	
A. Demographic Information			
1. Active Number Count	106,846	106,302	0.5%
2. Retired Member and Beneficiary Count	77,201	75,509	2.2%
3. Vested Former Member Count	25,188	25,493	-1.2%
4. Total Number Count	209,235	207,304	0.9%
5. Active Payroll	\$ 6,941,096,601	\$ 6,780,838,352	2.4%
6. Annual Benefits for Retired Members [#]	\$ 2,189,605,461	\$ 2,088,365,347	4.8%
B. Actuarial Results			
1. Present Value of Projected Benefits Attributable to:			
a. Retired and Disabled Members, and Beneficiaries	\$ 24,650,166,960	\$ 23,675,420,066	4.1%
b. Terminated Vested Members	1,035,541,541	971,210,579	6.6%
c. Active Members	24,907,138,206	24,255,682,661	2.7%
d. Total Present Value	\$ 50,592,846,707	\$ 48,902,313,306	3.5%
2. Less Present Value Total Future Normal Costs	7,853,284,975	7,703,327,855	1.9%
3. Actuarial Accrued Liability (1d - 2)	\$ 42,739,561,732	\$ 41,198,985,451	3.7%
4. Less Actuarial Value of Assets	31,945,910,198	30,500,872,500	4.7%
5. Unfunded Actuarial Accrued Liability (UAAL) (3 - 4)	\$ 10,793,651,534	\$ 10,698,112,951	0.9%
6. Funded Ratio	74.75%	74.03%	
7. Employer Normal Cost	\$ 313,444,652	\$ 308,454,573	1.6%
8. Total Projected Payroll	\$ 7,156,270,596	\$ 6,994,434,760	2.3%
9. Total Normal Cost Rate	11.38%	11.41%	
10. Employee Contribution Rate	7.00%	7.00%	
11. Employers [@] Normal Cost Rate	4.38%	4.41%	
12. UAAL Amortization Rate [*]	11.21%	11.02%	
13. Total Actuarial Employer Contribution Rate	15.59%	15.43%	
14. Estimated Employer Rate after Reinvestment of Savings	16.30%	16.16%	

[#] Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018 and July 1, 2017, respectively.

[@] Employers include the State and local Boards of Education.

^{*} Includes the effects of the one year lag between the valuation date and the beginning of the contribution period.

Detailed Actuarial Information

Employees' Combined System (State)

	Actuarial Valuation Performed		% Change
	June 30, 2018 (for FY 2020)	June 30, 2017 (for FY 2019)	
A. Demographic Information			
1. Active Number Count	56,663	57,615	-1.7%
2. Retired Member and Beneficiary Count	60,120	58,256	3.2%
3. Vested Former Member Count	20,047	20,887	-4.0%
4. Total Number Count	136,830	136,758	0.1%
5. Active Payroll	\$ 3,165,587,514	\$ 3,218,597,591	-1.6%
6. Annual Benefits for Retired Members [#]	\$ 1,115,419,793	\$ 1,039,769,310	7.3%
B. Actuarial Results			
1. Present Value of Projected Benefits Attributable to:			
a. Retired and Disabled Members, and Beneficiaries	\$ 12,622,760,393	\$ 11,774,848,429	7.2%
b. Terminated Vested Members	811,846,746	788,967,405	2.9%
c. Active Members	9,454,801,754	9,723,858,723	-2.8%
d. Total Present Value	\$ 22,889,408,893	\$ 22,287,674,557	2.7%
2. Less Present Value Total Future Normal Costs	2,493,947,824	2,537,608,306	-1.7%
3. Actuarial Accrued Liability (1d - 2)	\$ 20,395,461,069	\$ 19,750,066,251	3.3%
4. Less Actuarial Value of Assets	13,409,959,183	12,848,684,018	4.4%
5. Unfunded Actuarial Accrued Liability (UAAL) (3 - 4)	\$ 6,985,501,886	\$ 6,901,382,233	1.2%
a. Less Present Value of Special Liability Payments ^{**}	13,315,633	18,930,642	-29.7%
b. State Portion of UAAL (5 - 6)	6,972,186,253	6,882,451,591	1.3%
6. Funded Ratio	65.75%	65.06%	
7. Employer Normal Cost	\$ 123,749,766	\$ 125,198,773	-1.2%
8. Total Projected Payroll	\$ 3,214,279,637	\$ 3,268,897,463	-1.7%
9. Total Normal Cost Rate	10.59%	10.58%	
10. Employee Contribution Rate	6.74%	6.75%	
11. Employers' Normal Cost Rate	3.85%	3.83%	
12. UAAL Amortization Rate [*]	15.71%	14.75%	
13. Total Actuarial Employer Contribution Rate	19.56%	18.58%	
14. Estimated Employer Rate after Reinvestment of Savings	20.22%	19.23%	

^{**} For Municipalities that withdrew prior to 1996, and thus are part of the State pool. Please see page II-9 for additional details.

^{*} Includes the effects of the one-year lag between the valuation date and the beginning of the contribution period.

[#] Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018 and July 1, 2017, respectively.

Special Liability Payments Employees' Combined System (State)

Schedule of Special Payments as of June 30, 2018 for December 2019 Billing
(Unless noted, amounts are amortized over 25 years with payments increasing 5% per year)

LOC Number	Municipal Corporation	Outstanding Balance as of 6/30/2018*	December 2018 Payment	December 2019 Payment	Last Payment Year
7012	Caroline County Roads Board	\$ 49,581	\$ 26,620 **	\$ 26,620 **	2019
7716	Harford County Liquor Board	19,318	10,372 **	10,372 **	2019
8006	Montgomery County Public Library	6,992	3,754 **	3,754 **	2019
8028	Interstate Comm. on Potomac River Basin	8,361	4,489 **	4,489 **	2019
8031	Bethesda Fire Department	4,066	2,183 **	2,183 **	2019
8032	Chevy Chase Fire Department	8,326	4,470 **	4,470 **	2019
8712	Wicomico County Roads Board	8,590	4,612 **	4,612 **	2019
6529	Health Systems Agency of Western MD	86,981	45,601	47,881	2019
6611	Anne Arundel County Government	4,299,371	2,254,020	2,366,721	2019
6735	Lexington Market Authority	174,751	91,616	96,197	2019
6740	Univ of MD Medical Systems Corp	789,278	457,777 ***	387,221 ***	2019
8002	Montgomery County Board of Education	1,302,346	682,778	716,917	2019
8011	Montgomery County Government	2,893,118	1,516,768	1,592,606	2019
8026	MD Nat. Capital Parks and Planning Comm.	974,804	511,058	536,611	2019
8128	Washington Suburban Sanitary Commission	2,003,501	1,050,370	1,102,889	2019
8325	St. Mary's Nursing Home	229,152	120,137	126,144	2019
8611	Washington County Commission	170,474	89,374	93,843	2019
8612	Washington County Roads Board	137,562	72,119	75,725	2019
8614	Washington County License Commission	1,034	542	569	2019
8626	Washington County Sanitary District	41,520	21,768	22,856	2019
8726	Wicomico Co. Dept. Recreation & Parks	106,507	55,838	58,630	2019
	TOTAL	\$ 13,315,633	\$ 7,026,266	\$ 7,281,310	

* The outstanding balance is based on the 7.45% valuation interest rate in order to determine what portion of the total unfunded liability is attributable to the State liability and the special payment liability. The special payment liability is based on the present value of the contributions based on the payment schedule established at entry or withdrawal discounted at the current investment return assumption. Actual payoff amounts will be based on the interest rate in effect when the balance was first established.

** Level dollar payments or credits.

*** Dollar payments decrease each year based on a schedule provided by the prior actuary.

Detailed Actuarial Information

State Police

	Actuarial Valuation Performed		
	June 30, 2018 (for FY 2020)	June 30, 2017 (for FY 2019)	% Change
A. Demographic Information			
1. Active Number Count	1,347	1,371	-1.8%
2. Retired Member and Beneficiary Count	2,477	2,572	-3.7%
3. Vested Former Member Count	99	90	10.0%
4. Total Number Count	3,923	4,033	-2.7%
5. Active Payroll	\$ 100,324,842	\$ 100,384,047	-0.1%
6. Annual Benefits for Retired Members [#]	\$ 123,862,208	\$ 120,251,026	3.0%
B. Actuarial Results			
1. Present Value of Projected Benefits Attributable to:			
a. Retired and Disabled Members, and Beneficiaries	\$ 1,775,034,711	\$ 1,733,887,279	2.4%
b. Terminated Vested Members	15,875,962	14,323,388	10.8%
c. Active Members	683,010,417	677,862,556	0.8%
d. Total Present Value	\$ 2,473,921,090	\$ 2,426,073,223	2.0%
2. Less Present Value Total Future Normal Costs	223,222,171	227,736,682	-2.0%
3. Actuarial Accrued Liability (1d – 2)	\$ 2,250,698,919	\$ 2,198,336,541	2.4%
4. Less Actuarial Value of Assets	1,468,640,940	1,408,753,508	4.3%
5. Unfunded Actuarial Accrued Liability (UAAL) (3 - 4)	\$ 782,057,979	\$ 789,583,033	-1.0%
6. Funded Ratio	65.25%	64.08%	
7. Employer Normal Cost	\$ 24,489,069	\$ 24,652,196	-0.7%
8. Total Projected Payroll	\$ 101,868,009	\$ 101,952,837	-0.1%
9. Total Normal Cost Rate	32.04%	32.18%	
10. Employee Contribution Rate	8.00%	8.00%	
11. Employers' Normal Cost Rate	24.04%	24.18%	
12. UAAL Amortization Rate [*]	55.54%	54.23%	
13. Total Actuarial Employer Contribution Rate	79.58%	78.41%	
14. Estimated Employer Rate after Reinvestment of Savings	80.58%	79.41%	

^{*} Includes the effects of the one-year lag between the valuation date and the beginning of the contribution period.

[#] Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018 and July 1, 2017, respectively.

Detailed Actuarial Information

Judges

	Actuarial Valuation Performed		
	June 30, 2018 (for FY 2020)	June 30, 2017 (for FY 2019)	% Change
A. Demographic Information			
1. Active Number Count	316	312	1.3%
2. Retired Member and Beneficiary Count	421	417	1.0%
3. Vested Former Member Count	9	9	0.0%
4. Total Number Count	746	738	1.1%
5. Active Payroll	\$ 47,498,152	\$ 46,875,642	1.3%
6. Annual Benefits for Retired Members [#]	\$ 33,319,561	\$ 31,359,577	6.3%
B. Actuarial Results			
1. Present Value of Projected Benefits Attributable to:			
a. Retired and Disabled Members, and Beneficiaries	\$ 374,350,823	\$ 352,335,702	6.2%
b. Terminated Vested Members	3,764,605	3,378,196	11.4%
c. Active Members	294,488,571	292,984,445	0.5%
d. Total Present Value	\$ 672,603,999	\$ 648,698,343	3.7%
2. Less Present Value Total Future Normal Costs	115,857,569	112,796,685	2.7%
3. Actuarial Accrued Liability (1d – 2)	\$ 556,746,430	\$ 535,901,658	3.9%
4. Less Actuarial Value of Assets	477,005,959	453,133,735	5.3%
5. Unfunded Actuarial Accrued Liability (UAAL) (3 - 4)	\$ 79,740,471	\$ 82,767,923	-3.7%
6. Funded Ratio	85.68%	84.56%	
7. Employer Normal Cost	\$ 15,669,522	\$ 15,444,103	1.5%
8. Total Projected Payroll	\$ 48,228,754	\$ 47,608,209	1.3%
9. Total Normal Cost Rate	39.18%	38.91%	
10. Employee Contribution Rate	6.69%	6.47%	
11. Employers' Normal Cost Rate	32.49%	32.44%	
12. UAAL Amortization Rate*	11.95%	12.09%	
13. Estimated Employer Rate after Reinvestment of Savings	44.44%	44.53%	

*Includes the effects of the one-year lag between the valuation date and the beginning of the contribution period.

[#]Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018 and July 1, 2017, respectively.

Detailed Actuarial Information LEOPS (State)

	Actuarial Valuation Performed		
	June 30, 2018 (for FY 2020)	June 30, 2017 (for FY 2019)	% Change
A. Demographic Information			
1. Active Number Count	1,590	1,564	1.7%
2. Retired Member and Beneficiary Count	1,520	1,482	2.6%
3. Vested Former Member Count	190	190	0.0%
4. Total Number Count	3,300	3,236	2.0%
5. Active Payroll	\$ 107,729,522	\$ 106,826,152	0.8%
6. Annual Benefits for Retired Members [#]	\$ 53,492,348	\$ 49,994,236	7.0%
B. Actuarial Results			
1. Present Value of Projected Benefits Attributable to:			
a. Retired and Disabled Members, and Beneficiaries	\$ 761,837,866	\$ 717,757,710	6.1%
b. Terminated Vested Members	21,133,198	20,100,049	5.1%
c. Active Members	474,926,192	464,859,212	2.2%
d. Total Present Value	\$ 1,257,897,256	\$ 1,202,716,971	4.6%
2. Less Present Value Total Future Normal Costs	165,195,942	163,061,746	1.3%
3. Actuarial Accrued Liability (1d – 2)	\$ 1,092,701,314	\$ 1,039,655,225	5.1%
4. Less Actuarial Value of Assets	695,528,805	657,128,367	5.8%
5. Unfunded Actuarial Accrued Liability (UAAL) (3 - 4)	\$ 397,172,509	\$ 382,526,858	3.8%
6. Funded Ratio	63.65%	63.21%	
7. Employer Normal Cost	\$ 16,484,558	\$ 16,350,290	0.8%
8. Total Projected Payroll	\$ 109,386,585	\$ 108,495,619	0.8%
9. Total Normal Cost Rate	22.07%	22.07%	
10. Employee Contribution Rate	7.00%	7.00%	
11. Employers' Normal Cost Rate	15.07%	15.07%	
12. UAAL Amortization Rate*	26.30%	24.71%	
13. Total Actuarial Employer Contribution Rate	41.37%	39.78%	
14. Estimated Employer Rate after Reinvestment of Savings	42.40%	40.81%	

*Includes the effects of the one-year lag between the valuation date and the beginning of the contribution period.

[#]Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018 and July 1, 2017, respectively.

Risk Measures Summary

State and Municipal

(\$ in Millions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			Market		Market				
	Accrued	Market	Value	Valuation	Value	Retiree	RetLiab /	AAL /	Assets /
Valuation	Liabilities	Value of	Unfunded	Payroll	Funded	Liabilities	AAL	Payroll	Payroll
Date (6/30)	(AAL)	Assets	AAL		Ratio	(RetLiab)	(6)/(1)	(1)/(4)	(2)/(4)
					(2)/(1)				
2012	\$ 57,869	\$ 37,179	\$ 20,690	\$ 10,337	64.2%	\$ 32,779	56.6%	559.9%	359.7%
2013	60,060	40,363	19,697	10,478	67.2%	34,498	57.4%	573.2%	385.2%
2014	62,610	45,340	17,270	10,804	72.4%	36,077	57.6%	579.5%	419.7%
2015	66,282	45,790	20,492	11,064	69.1%	38,588	58.2%	599.1%	413.9%
2016	67,782	45,366	22,416	11,156	66.9%	39,785	58.7%	607.6%	406.7%
2017	69,987	48,987	20,999	11,419	70.0%	41,112	58.7%	612.9%	429.0%
2018	72,575	51,827	20,747	11,566	71.4%	43,237	59.6%	627.5%	448.1%

- (5). The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.
- (6) and (7). The ratio of Retiree liabilities to total accrued liabilities gives an indication of the maturity of the system. As the ratio increases, cash flow needs increase, and the liquidity needs of the portfolio change. A ratio on the order of 50% indicates a maturing system.
- (8) and (9). The ratios of liabilities and assets to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

Risk Measures Summary

State and Municipal

(\$ in Millions)

	(10)	(11)	(12)	(13)	(14)	(15)	(16)
				Non- Investment Cash Flow (NICF)	NICF / Assets (13)/(2)	Market Rate of Return	5-Year Trailing Average
Valuation Date (6/30)	Portfolio StdDev	Std Dev % of Pay	Unfunded / Payroll				
2012			200.2%	\$ (518)	-1.4%	0.3%	0.7%
2013			188.0%	(661)	-1.6%	10.4%	3.9%
2014			159.9%	(729)	-1.6%	14.3%	11.6%
2015	12.5%	51.7%	185.2%	(748)	-1.6%	2.7%	9.3%
2016	12.0%	48.8%	200.9%	(921)	-2.0%	1.1%	5.6%
2017	13.3%	57.1%	183.9%	(852)	-1.7%	10.0%	7.6%
2018	13.3%	59.6%	179.4%	(1,059)	-2.0%	8.1%	7.1%

- (10) and (11). The portfolio standard deviation measures the volatility of investment return. When multiplied by the ratio of assets to payroll it gives the effect of a one standard deviation asset move as a percent of payroll. This figure helps users understand the difficulty of dealing with investment volatility and the challenges volatility brings to sustainability. This ratio is likely to increase as the plan approaches full funding.
- (12). The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.
- (13) and (14). The ratio of Non-Investment Cash Flow to assets is an important measure of sustainability. Negative ratios are common and expected for a maturing system. In the longer term, this ratio should be on the order of approximately -4%. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.
- (15) and (16). Investment return is probably the largest single risk that most systems face. The year-by-year return and the 5-year geometric average both give an indication of the reasonableness of the system's assumed return. Of course, past performance is not a guarantee of future results. Market rate shown is based on actuarial estimation method and differs modestly from figures reported by State Street.

SECTION III

ASSETS

Assets

Pension plan assets play a key role in the financial operation of the plan 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, negotiated contributions, and the ultimate security of participants' benefits.

In this section we present detailed information on plan assets including:

- **Disclosure** of plan assets at June 30, 2018 and June 30, 2017;
- Statement of the **changes** in market values during the year;
- Development of the Actuarial Value of Assets; and
- An assessment of **investment performance**.

Disclosure

Market values represent "snapshot" or "cash-out" values which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate. As a result, actuaries have traditionally smoothed market fluctuations when developing long range contribution rates.

Current methods employed by this Fund set the actuarial value equal to the expected adjusted market value plus one-fifth of the difference between the actual market value and the expected adjusted market value. In addition, there is a 20% collar limitation which keeps the actuarial value of assets within the range of 80% to 120% of the market value of assets.

Disclosure of Plan Market Value of Assets (State and Municipal) (\$ in Thousands)

	June 30,	
	2018	2017
Assets:		
Cash & Cash Equivalents	\$ 1,252,466	\$ 1,034,221
<i>Receivables</i>		
Contributions		
Employers	11,643	16,621
Employers - Long Term	18,120	22,965
Members	7,461	3,157
Accrued Investment Income	151,421	88,691
Investment Sales Proceeds	1,006,317	997,205
Total Receivables	1,194,962	1,128,639
<i>Investments</i>		
U.S. Government Obligations	6,585,127	7,371,619
Domestic Corporate Obligations	3,472,338	3,927,861
International Obligations	90,497	120,974
Domestic Stocks	9,466,331	8,008,898
International Stocks	10,185,922	9,881,644
Mortgages & Mortgage Related Securities	1,528,439	1,515,284
Alternative Investments	19,245,043	18,233,852
Collateral For Loaned Securities	2,043,411	2,553,919
Total Investments	52,617,108	51,614,051
Total Assets	55,064,536	53,776,911
Liabilities:		
Accounts Payable & Accrued Expenses	60,407	63,796
Investment Commitments Payable	1,133,485	2,172,013
Obligation For Collateral For Loaned Securities	2,043,411	2,553,919
Other Liabilities	-	-
Total Liabilities	3,237,303	4,789,728
 Net Assets Held in Trust for Pension Benefits	 \$ 51,827,233	 \$ 48,987,183

Changes in Market Values (State and Municipal)

	Teachers	Employees (State)	State Police	Judges	LEOPS (State)	Total State	
State Sponsored Plans							
Market Value of Assets as of 6/30/2017	\$ 29,731,190,619	\$ 12,529,264,032	\$ 1,371,781,065	\$ 441,352,187	\$ 640,709,450	\$ 44,714,297,353	
Employer Contributions	1,122,985,967	611,150,832	80,240,937	22,465,434	42,298,159	1,879,141,329	
Member Contributions	484,922,784	220,103,491	8,062,999	3,071,204	7,793,033	723,953,512	
Investment Returns	2,364,521,117	998,663,174	109,405,399	35,195,274	50,694,913	3,558,479,877	
Disbursements from the Trust	(2,223,398,658)	(1,137,952,258)	(122,962,796)	(32,063,738)	(57,216,995)	(3,573,594,445)	
Net Transfers	229,344	(1,653,625)	20,785	-	1,403,496	-	
Market Value of Assets as of 6/30/2018	\$ 31,480,451,174.15	\$ 13,219,575,645	\$ 1,446,548,389	\$ 470,020,361	\$ 685,682,057	\$ 47,302,277,626	
		Employees (Municipal)			LEOPS (Municipal)	CORS (Municipal)	Total Municipal
Municipal Plans							
Market Value of Assets as of 6/30/2017		\$ 3,988,843,813			\$ 261,484,312	\$ 22,557,026	\$ 4,272,885,151
Employer Contributions		95,542,137			19,832,630	501,423	115,876,190
Member Contributions		63,290,727			4,061,842	276,500	67,629,069
Investment Returns		317,960,894			21,138,655	1,813,706	340,913,255
Disbursements from the Trust		(256,479,973)			(14,925,897)	(942,809)	(272,348,679)
Net Transfers		-			-	-	-
Market Value of Assets as of 6/30/2018		\$ 4,209,157,598			\$ 291,591,543	\$ 24,205,846	\$ 4,524,954,986
	Teachers	Employees (State & Municipal)	State Police	Judges	LEOPS (State & Municipal)	CORS (Municipal)	Total State & Municipal
State and Municipal Sponsored Plans							
Market Value of Assets as of 6/30/2017	\$ 29,731,190,619	\$ 16,518,107,845	\$ 1,371,781,065	\$ 441,352,187	\$ 902,193,763	\$ 22,557,026	\$ 48,987,182,505
Employer Contributions	1,122,985,967	706,692,969	80,240,937	22,465,434	62,130,789	501,423	1,995,017,519
Member Contributions	484,922,784	283,394,218	8,062,999	3,071,204	11,854,875	276,500	791,582,581
Investment Returns	2,364,521,117	1,316,624,068	109,405,399	35,195,274	71,833,568	1,813,706	3,899,393,133
Disbursements from the Trust	(2,223,398,658)	(1,394,432,231)	(122,962,796)	(32,063,738)	(72,142,892)	(942,809)	(3,845,943,124)
Net Transfers	229,344	(1,653,625)	20,785	-	1,403,496	-	-
Market Value of Assets as of 6/30/2018	\$ 31,480,451,174	\$ 17,428,733,244	\$ 1,446,548,389	\$ 470,020,361	\$ 977,273,599	\$ 24,205,846	\$ 51,827,232,613

Totals may not add due to rounding.

Summary of the Development of the Actuarial Value of Assets

June 30, 2018

	Total State	Total Municipal	Total MSRPS
Beginning of Year:			
(1) Market Value of Assets	\$44,714,297,353	\$4,272,885,151	\$48,987,182,504
(2) Actuarial Value of Assets	45,868,572,128	4,381,892,589	50,250,464,717
End of Year:			
(3) Market Value of Assets	47,302,277,627	4,524,954,987	51,827,232,614
(4) Net of Contributions and Disbursements	(970,499,604)	(88,843,420)	(1,059,343,024)
(5) Total Investment Income			
=(3)-(1)-(4)	3,558,479,878	340,913,256	3,899,393,134
(6) Projected Rate of Return	7.50%	7.50%	7.50%
(7) Projected Investment Income			
=(1)x(6)+[1+(6)] ^{.5} -1)x(4)	\$ 3,317,836,499	\$ 317,194,989	\$ 3,635,031,488
(8) Beginning of Year Asset Adjustment	0	0	0
(9) Investment Income in Excess of Projected Income	240,643,379	23,718,267	264,361,646
(10) Excess Investment Income Recognized This Year (5-year recognition)			
(10a) From This Year	48,128,675	4,743,653	52,872,328
(10b) From One Year Ago	196,865,422	19,114,522	215,979,944
(10c) From Two Years Ago	(534,124,901)	(50,965,240)	(585,090,141)
(10d) From Three Years Ago	(409,628,622)	(38,923,668)	(448,552,290)
(10e) From Four Years Ago	479,895,489	45,277,524	525,173,013
(10f) Total Phase-ins	(218,863,937)	(20,753,209)	(239,617,146)
(11) Change in Actuarial Value of Assets			
=(4)+(7)+(8)+(10f)	2,128,472,959	207,598,360	2,336,071,319
End of Year:			
(3) Market Value of Assets as of 6/30	47,302,277,627	4,524,954,987	51,827,232,614
(12) Preliminary Actuarial Value of Assets = (2)+(11)	47,997,045,086	4,589,490,949	52,586,536,035
(12a) Upper Collar Limit 120% x (3)	56,762,733,151	5,429,945,985	62,192,679,136
(12b) Lower Collar Limit 80% x (3)	37,841,822,102	3,619,963,989	41,461,786,091
(13) Adjustment to Remain within 20% Collar	0	0	0
(14) Final Actuarial Value of Assets as of 6/30	47,997,045,086	4,589,490,949	52,586,536,035
(15) Difference Between Market & Actuarial Values	(694,767,459)	(64,535,962)	(759,303,421)
(16) Actuarial Value Rate of Return	6.83%	6.83%	6.83%
(17) Market Value Rate of Return	8.05%	8.06%	8.05%
(18) Ratio of Actuarial Value to Market Value	101%	101%	101%

Summary of the Development of the Actuarial Value of Assets (State Portion Only)

June 30, 2018

	TCS	ECS	State Police	Judges	LEOPS	Total State
Beginning of Year:						
(1) Market Value of Assets	\$29,731,190,619	\$12,529,264,032	\$ 1,371,781,065	\$441,352,187	\$640,709,450	\$44,714,297,353
(2) Actuarial Value of Assets	30,500,872,500	12,848,684,018	1,408,753,508	453,133,735	657,128,367	45,868,572,128
End of Year:						
(3) Market Value of Assets	31,480,451,174	13,219,575,645	1,446,548,389	470,020,361	685,682,057	47,302,277,627
(4) Net of Contributions and Disbursements	(615,260,562)	(308,351,561)	(34,638,074)	(6,527,100)	(5,722,307)	(970,499,604)
(5) Total Investment Income						
=(3)-(1)-(4)	\$ 2,364,521,117	\$998,663,174	\$ 109,405,399	\$ 35,195,274	\$ 50,694,914	\$ 3,558,479,878
(6) Projected Rate of Return	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
(7) Projected Investment Income						
=(1)x(6)+[(1+(6))^5-1]x(4)	\$ 2,207,184,130	\$ 928,340,660	\$ 101,608,134	\$ 32,861,073	\$ 47,842,502	\$ 3,317,836,499
(8) Beginning of Year Asset Adjustment	0	0	0	0	0	0
(9) Investment Income in Excess of Projected Income	\$ 157,336,987	\$ 70,322,514	\$ 7,797,265	\$ 2,334,201	\$ 2,852,412	\$ 240,643,379
(10) Excess Investment Income Recognized This Year (5-year recognition)						
(10a) From This Year	31,467,397	14,064,503	1,559,453	466,840	570,482	48,128,675
(10b) From One Year Ago	130,099,381	56,016,846	5,989,864	1,917,407	2,841,924	196,865,422
(10c) From Two Years Ago	(355,000,835)	(149,780,626)	(16,596,414)	(5,277,155)	(7,469,871)	(534,124,901)
(10d) From Three Years Ago	(271,625,085)	(115,130,832)	(13,107,124)	(4,050,868)	(5,714,713)	(409,628,622)
(10e) From Four Years Ago	318,173,272	136,116,175	15,071,593	4,482,027	6,052,422	479,895,489
(10f) Total Phase-ins	(146,885,870)	(58,713,934)	(7,082,628)	(2,461,749)	(3,719,756)	(218,863,937)
(11) Change in Actuarial Value of Assets = (4)+(7)+(8)+(10f)	1,445,037,698	561,275,165	59,887,432	23,872,224	38,400,439	2,128,472,959
End of Year:						
(3) Market Value of Assets as of 6/30	31,480,451,174	13,219,575,645	1,446,548,389	470,020,361	685,682,057	47,302,277,627
(12) Preliminary Actuarial Value of Assets = (2)+(11)	31,945,910,198	13,409,959,183	1,468,640,940	477,005,959	695,528,805	47,997,045,086
(12a) Upper Collar Limit 120% x (3)	37,776,541,409	15,863,490,774	1,735,858,067	564,024,433	822,818,468	56,762,733,151
(12b) Lower Collar Limit 80% x (3)	25,184,360,939	10,575,660,516	1,157,238,712	376,016,289	548,545,646	37,841,822,102
(13) Adjustment to Remain within 20% Collar	0	0	0	0	0	0
(14) Final Actuarial Value of Assets as of 6/30	31,945,910,198	13,409,959,183	1,468,640,940	477,005,959	695,528,805	47,997,045,086
(15) Difference Between Market & Actuarial Values	(465,459,024)	(190,383,538)	(22,092,551)	(6,985,598)	(9,846,748)	(694,767,459)
(16) Actuarial Value Rate of Return	6.82%	6.85%	6.79%	6.76%	6.74%	6.83%
(17) Market Value Rate of Return	8.04%	8.07%	8.08%	8.03%	7.95%	8.05%
(18) Ratio of Actuarial Value to Market Value	101%	101%	102%	101%	101%	101%

Development of the Actuarial Value of Assets Teachers' Combined System

	2017	2018	2019	2020	2021	2022
Beginning of Year:						
(1) Market Value of Assets	\$27,542,212,468	\$29,731,190,619				
(2) Actuarial Value of Assets	29,020,809,180	30,500,872,500				
End of Year:						
(3) Market Value of Assets	29,731,190,619	31,480,451,174				
(4) Net of Contributions and Disbursements	(521,622,804)	(615,260,562)				
(5) Total Investment Income						
=(3)-(1)-(4)	2,710,600,954	2,364,521,117				
(6) Projected Rate of Return	7.55%	7.50%				
(7) Projected Investment Income						
=(1)x(6)+[(1+(6))^5-1]x(4)	2,060,104,051	2,207,184,130				
(8) Beginning of Year Asset Adjustment	0	0				
(9) Investment Income in						
Excess of Projected Income	650,496,903	157,336,987				
(10) Excess Investment Income Recognized						
This Year (5-year recognition)						
(10a) From This Year	130,099,381	31,467,397				
(10b) From One Year Ago	(355,000,835)	130,099,381	\$ 31,467,397			
(10c) From Two Years Ago	(271,625,085)	(355,000,835)	130,099,381	\$ 31,467,397		
(10d) From Three Years Ago	318,173,274	(271,625,085)	(355,000,835)	130,099,381	\$ 31,467,397	
(10e) From Four Years Ago	119,935,338	318,173,272	(271,625,086)	(355,000,835)	130,099,379	\$ 31,467,399
(10f) Total Phase-ins	(58,417,927)	(146,885,870)	(465,059,143)	(193,434,057)	161,566,776	31,467,399
(11) Change in Actuarial Value of Assets						
=(4)+(7)+(8)+(10f)	1,480,063,320	1,445,037,698				
End of Year:						
(3) Market Value of Assets	29,731,190,619	31,480,451,174				
(12) Preliminary Actuarial Value of Assets = (2)+(11)	30,500,872,500	31,945,910,198				
(12a) Upper Collar Limit 120% x (3)	35,677,428,743	37,776,541,409				
(12b) Lower Collar Limit 80% x (3)	23,784,952,495	25,184,360,939				
(13) Adjustment to Remain within 20% Collar	0	0				
(14) Final Actuarial Value of Assets as of 6/30	30,500,872,500	31,945,910,198				
(15) Difference Between Market & Actuarial Values	(769,681,881)	(465,459,024)				
(16) Actuarial Value Rate of Return	6.96%	6.82%				
(17) Market Value Rate of Return	9.94%	8.04%				
(18) Ratio of Actuarial Value to Market Value	103%	101%				

Development of the Actuarial Value of Assets Employees' Combined System (State)

	2017	2018	2019	2020	2021	2022
Beginning of Year:						
(1) Market Value of Assets	\$11,600,263,665	\$12,529,264,032				
(2) Actuarial Value of Assets	12,220,633,519	12,848,684,018				
End of Year:						
(3) Market Value of Assets	12,529,264,032	13,219,575,645				
(4) Net of Contributions and Disbursements	(218,794,550)	(308,351,561)				
(5) Total Investment Income						
=(3)-(1)-(4)	1,147,794,917	998,663,174				
(6) Projected Rate of Return	7.55%	7.50%				
(7) Projected Investment Income						
=(1)x(6)+([1+(6)] ^{.5} -1)x(4)	867,710,689	928,340,660				
(8) Beginning of Year Asset Adjustment	0	0				
(9) Investment Income in Excess of Projected Income	280,084,228	70,322,514				
(10) Excess Investment Income Recognized						
This Year (5-year recognition)						
(10a) From This Year	56,016,846	14,064,503				
(10b) From One Year Ago	(149,780,626)	56,016,846	\$ 14,064,503			
(10c) From Two Years Ago	(115,130,832)	(149,780,626)	56,016,846	\$ 14,064,503		
(10d) From Three Years Ago	136,116,176	(115,130,832)	(149,780,626)	56,016,846	\$ 14,064,503	
(10e) From Four Years Ago	51,912,796	136,116,175	(115,130,834)	(149,780,625)	56,016,844	\$ 14,064,502
(10f) Total Phase-ins	(20,865,640)	(58,713,934)	(194,830,111)	(79,699,276)	70,081,347	14,064,502
(11) Change in Actuarial Value of Assets						
=(4)+(7)+(8)+(10f)	628,050,499	561,275,165				
End of Year:						
(3) Market Value of Assets	12,529,264,032	13,219,575,645				
(12) Preliminary Actuarial Value of Assets = (2)+(11)	12,848,684,018	13,409,959,183				
(12a) Upper Collar Limit 120% x (3)	15,035,116,838	15,863,490,774				
(12b) Lower Collar Limit 80% x (3)	10,023,411,226	10,575,660,516				
(13) Adjustment to Remain within 20% Collar	0	0				
(14) Final Actuarial Value of Assets as of 6/30	12,848,684,018	13,409,959,183				
(15) Difference Between Market & Actuarial Values	(319,419,986)	(190,383,538)				
(16) Actuarial Value Rate of Return	6.99%	6.85%				
(17) Market Value Rate of Return	9.99%	8.07%				
(18) Ratio of Actuarial Value to Market Value	103%	101%				

Development of the Actuarial Value of Assets State Police

	2017	2018	2019	2020	2021	2022
Beginning of Year:						
(1) Market Value of Assets	\$ 1,274,132,477	\$ 1,371,781,065				
(2) Actuarial Value of Assets	1,344,162,518	1,408,753,508				
End of Year:						
(3) Market Value of Assets	1,371,781,065	1,446,548,389				
(4) Net of Contributions and Disbursements	(27,479,264)	(34,638,074)				
(5) Total Investment Income						
=(3)-(1)-(4)	125,127,852	109,405,399				
(6) Projected Rate of Return	7.55%	7.50%				
(7) Projected Investment Income						
=(1)x(6)+[(1+(6))^5-1]x(4)	95,178,534	101,608,134				
(8) Beginning of Year Asset Adjustment	0	0				
(9) Investment Income in Excess of Projected Income	29,949,318	7,797,265				
(10) Excess Investment Income Recognized						
This Year (5-year recognition)						
(10a) From This Year	5,989,864	1,559,453				
(10b) From One Year Ago	(16,596,414)	5,989,864	\$ 1,559,453			
(10c) From Two Years Ago	(13,107,124)	(16,596,414)	5,989,864	\$ 1,559,453		
(10d) From Three Years Ago	15,071,592	(13,107,124)	(16,596,414)	5,989,864	\$ 1,559,453	
(10e) From Four Years Ago	5,533,803	15,071,593	(13,107,126)	(16,596,413)	5,989,862	\$ 1,559,453
(10f) Total Phase-ins	(3,108,279)	(7,082,628)	(22,154,223)	(9,047,096)	7,549,315	1,559,453
(11) Change in Actuarial Value of Assets						
=(4)+(7)+(8)+(10f)	64,590,991	59,887,432				
End of Year:						
(3) Market Value of Assets	1,371,781,065	1,446,548,389				
(12) Preliminary Actuarial Value of Assets = (2)+(11)	1,408,753,508	1,468,640,940				
(12a) Upper Collar Limit 120% x (3)	1,646,137,278	1,735,858,067				
(12b) Lower Collar Limit 80% x (3)	1,097,424,852	1,157,238,712				
(13) Adjustment to Remain within 20% Collar	0	0				
(14) Final Actuarial Value of Assets as of 6/30	1,408,753,508	1,468,640,940				
(15) Difference Between Market & Actuarial Values	(36,972,444)	(22,092,551)				
(16) Actuarial Value Rate of Return	6.92%	6.79%				
(17) Market Value Rate of Return	9.93%	8.08%				
(18) Ratio of Actuarial Value to Market Value	103%	102%				

Development of the Actuarial Value of Assets Judges

	2017	2018	2019	2020	2021	2022
Beginning of Year:						
(1) Market Value of Assets	\$407,663,481	\$441,352,187				
(2) Actuarial Value of Assets	430,563,204	453,133,735				
End of Year:						
(3) Market Value of Assets	441,352,187	470,020,361				
(4) Net of Contributions and Disbursements	(6,438,298)	(6,527,100)				
(5) Total Investment Income						
=(3)-(1)-(4)	40,127,004	35,195,274				
(6) Projected Rate of Return	7.55%	7.50%				
(7) Projected Investment Income						
=(1)x(6)+[(1+(6)) ⁵ -1]x(4)	30,539,969	32,861,073				
(8) Beginning of Year Asset Adjustment	0	0				
(9) Investment Income in Excess of Projected Income	9,587,035	2,334,201				
(10) Excess Investment Income Recognized						
This Year (5-year recognition)						
(10a) From This Year	1,917,407	466,840				
(10b) From One Year Ago	(5,277,155)	1,917,407	\$ 466,840			
(10c) From Two Years Ago	(4,050,868)	(5,277,155)	1,917,407	\$ 466,840		
(10d) From Three Years Ago	4,482,029	(4,050,868)	(5,277,155)	1,917,407	\$ 466,840	
(10e) From Four Years Ago	1,397,446	4,482,027	(4,050,870)	(5,277,154)	1,917,407	\$ 466,841
(10f) Total Phase-ins	(1,531,141)	(2,461,749)	(6,943,778)	(2,892,907)	2,384,247	466,841
(11) Change in Actuarial Value of Assets						
=(4)+(7)+(8)+(10f)	22,570,530	23,872,224				
End of Year:						
(3) Market Value of Assets	441,352,187	470,020,361				
(12) Preliminary Actuarial Value of Assets = (2)+(11)	453,133,735	477,005,959				
(12a) Upper Collar Limit 120% x (3)	529,622,625	564,024,433				
(12b) Lower Collar Limit 80% x (3)	353,081,750	376,016,289				
(13) Adjustment to Remain within 20% Collar	0	0				
(14) Final Actuarial Value of Assets as of 6/30	453,133,735	477,005,959				
(15) Difference Between Market & Actuarial Values	(11,781,547)	(6,985,598)				
(16) Actuarial Value Rate of Return	6.79%	6.76%				
(17) Market Value Rate of Return	9.92%	8.03%				
(18) Ratio of Actuarial Value to Market Value	103%	101%				

Development of the Actuarial Value of Assets LEOPS (State)

	2017	2018	2019	2020	2021	2022
Beginning of Year:						
(1) Market Value of Assets	\$581,207,002	\$640,709,450				
(2) Actuarial Value of Assets	613,970,553	657,128,367				
End of Year:						
(3) Market Value of Assets	640,709,450	685,682,057				
(4) Net of Contributions and Disbursements	1,361,246	(5,722,307)				
(5) Total Investment Income						
=(3)-(1)-(4)	58,141,202	50,694,914				
(6) Projected Rate of Return	7.55%	7.50%				
(7) Projected Investment Income						
=(1)x(6)+([1+(6)] ^{.5} -1)x(4)	43,931,581	47,842,502				
(8) Beginning of Year Asset Adjustment	0	0				
(9) Investment Income in Excess of Projected Income	14,209,621	2,852,412				
(10) Excess Investment Income Recognized						
This Year (5-year recognition)						
(10a) From This Year	2,841,924	570,482				
(10b) From One Year Ago	(7,469,871)	2,841,924	\$ 570,482			
(10c) From Two Years Ago	(5,714,713)	(7,469,871)	2,841,924	\$ 570,482		
(10d) From Three Years Ago	6,052,422	(5,714,713)	(7,469,871)	2,841,924	\$ 570,482	
(10e) From Four Years Ago	2,155,225	6,052,422	(5,714,712)	(7,469,869)	2,841,925	\$ 570,484
(10f) Total Phase-ins	(2,135,013)	(3,719,756)	(9,772,177)	(4,057,463)	3,412,407	570,484
(11) Change in Actuarial Value of Assets						
=(4)+(7)+(8)+(10f)	43,157,814	38,400,439				
End of Year:						
(3) Market Value of Assets	640,709,450	685,682,057				
(12) Preliminary Actuarial Value of Assets = (2)+(11)	657,128,367	695,528,805				
(12a) Upper Collar Limit 120% x (3)	768,851,340	822,818,468				
(12b) Lower Collar Limit 80% x (3)	512,567,560	548,545,646				
(13) Adjustment to Remain within 20% Collar	0	0				
(14) Final Actuarial Value of Assets as of 6/30	657,128,367	695,528,805				
(15) Difference Between Market & Actuarial Values	(16,418,917)	(9,846,748)				
(16) Actuarial Value Rate of Return	6.80%	6.74%				
(17) Market Value Rate of Return	9.99%	7.95%				
(18) Ratio of Actuarial Value to Market Value	103%	101%				

SECTION IV

**GAIN/LOSS EXPERIENCE ANALYSIS
STATE ONLY**

Gain/(Loss) Experience Analysis

State Only

Comments

Purpose of Gain/Loss Analysis

Regular actuarial valuations provide valuable information about the composite change in unfunded actuarial accrued liabilities – whether or not the liabilities are increasing or decreasing, and by how much. However, valuations do not show the portion of the change attributable to each risk area within the retirement system financial mechanism: the rate of investment income on plan assets; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of salary increases; and the assumed ages at actual retirement. In an actuarial valuation, assumptions are made as to what these rates will be for the next year and for decades in the future.

The objective of a gain and loss analysis is to determine the portion of the change in unfunded actuarial accrued liabilities attributable to each risk area.

The fact that actual experience differs from assumed experience is to be expected – the future cannot be predicted with precision. Changes in the valuation assumed experience for a risk area should be made when the differences between assumed and actual experience have been observed to be sizeable and persistent. One year's gain/loss analysis may or may not be indicative of *long-term trends, which are the basis of financial assumptions.*

The expected and actual numbers of retirements, disabilities, deaths, and terminations found on pages IV-5 through IV-11 reflect experience over the 12-month period from June 30, **2017** through June 30, **2018**.

Derivation of Experience Gain/(Loss)

Year Ended June 30, 2018

State Only

(\$ in Millions)

Actual experience will never (except by coincidence) coincide exactly with assumed experience. Gains and losses often offset one another over a period of years, but sizable year-to-year fluctuations are common.

	Fiscal Year Ended June 30,	
	2018	2017
(1) UAAL* at start of year	\$18,854	\$19,121
(2) Normal cost from last valuation	1,201	1,192
(3) Actual contributions	2,603	2,641
(4) Interest accrual: $[(1) \times .0750 + \{(2)-(3)\} \times \{[1.0750^{.5}]-1\}]$	1,363	1,390
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	18,815	19,062
(6) Change in benefit provisions	1	0
(7) Changes in methods and assumptions	140	117
(8) Expected UAAL after changes: (5) + (6) + (7)	18,956	19,179
(9) Actual UAAL at end of year	19,038	18,854
(10) Gain/(loss): (8) - (9)	(82)	325
(10a) Portion of gain/(loss) due to Assets	(305)	(254)
(10b) Portion of gain/(loss) due to Liabilities	223	579
(10c) Actuarial accrued liabilities at beginning of year	64,723	62,751
(11) Gain/(loss) as a percent of beginning accrued liabilities	(0.1%)	0.5%

* *Unfunded Actuarial Accrued Liability.*
Numbers may not add due to rounding.

Summary of System Experience
Year Ended June 30, 2018
State Only
(\$ in Millions)

	2018	
	Total State	% of AAL
Beginning of Year		
1. Total Actuarial Accrued Liabilities (AAL) #	\$64,722.95	100.0 %
2. Valuation Assets	45,868.57	70.9 %
3. Unfunded Actuarial Accrued Liabilities	\$18,854.37	29.1 %
2018 Experience Gains (Losses)		
4. Gains (losses) in economic risk areas		
a. Pay increases	\$ 340.97	0.5 %
b. Investment return	(305.43)	(0.5)%
c. Total	\$ 35.54	0.0 %
5. Gains (losses) from active member decrement experience		
a. Service retirement	\$ (44.10)	(0.1)%
b. Disability retirement	32.14	0.0 %
c. Death-in-service	(12.28)	0.0 %
d. Other separations	167.69	0.3 %
e. Total	\$ 143.45	0.2 %
6. Gains (losses) from retiree experience		
a. Mortality	\$ 154.05	0.2 %
b. Benefit related/COLAs	(163.30)	(0.3)%
c. Other/unexpected retirees & beneficiaries	66.10	0.1 %
d. Total	\$ 56.85	0.1 %
7. Gains (losses) from other sources		
a. Actual vs. expected liability for active terminations	\$ 51.40	0.1 %
b. Deferred members returning to work	(44.21)	(0.1)%
c. Deferred mortality/actual vs. expected liability	(15.28)	0.0 %
d. Data related	(25.40)	0.0 %
e. All other sources	(284.63)	(0.4)%
f. Total	\$ (318.12)	(0.5)%
8. Total experience gains (losses) (4c) + (5e) + (6d) + (7f)	\$ (82.29)	(0.3)%
End of Year		
9. Total Actuarial Accrued Liabilities*	\$66,894.52	100.0 %
10. Valuation Assets	47,997.05	71.8 %
11. Unfunded Actuarial Accrued Liabilities	\$18,897.47	28.2 %

* Prior to reflecting changes in assumptions and benefit provisions.
Totals may not add due to rounding.

Historical Summary of System Experience State Only (\$ in Millions)

Year	Gain (Loss) During the Year Due To								Total Experience
	Service Retirement	Disability Retirement	Survivor Benefits	Other Turnover	Pay Increases	Investment Return	Retiree Experience	Other Sources	
2017	8.2	19.3	(7.0)	115.6	185.8	(254.0)	408.9	(151.6)	325.1
2018	(44.1)	32.1	(12.3)	167.7	341.0	(305.4)	56.8	(318.1)	(82.3)

Active Member Population Development Year Ended June 30, 2018 State Only

	Total State	
	Actual	Expected
Beginning Census	167,164	
- Service Retirement	5,158	5,109
- Death	170	246
- Disability Retirement	376	523
- Other Separations	10,184	7,418
- Transfers Out	62	
+ Transfers In	38	
+ New Entrants	15,510	
Ending Census	166,762	

This page reconciles the active member populations reported in connection with the 2017 and 2018 valuations on an actual and expected basis. Assumptions related to population development are a primary focus of the gain/loss analysis. They generally tend to be more stable than economic assumptions, and therefore, measurements have more meaning.

Assumptions used for the pension valuation were established on a population-weighted basis with the exception of the withdrawal assumptions. Therefore, the expected "Other Separations" presented above for these divisions are based upon liability-weighted assumptions. If population-weighted assumptions were used, the expected numbers would be different.

Salary Increases
for Member Active Both at Beginning and End of Year
During the Year Ended June 30, 2018
State Only

Service Beginning of Year	Number	Salary Increases	
		Actual	Expected
0	628	4.66%	6.63%
1	10,786	4.82%	6.86%
2	9,132	4.31%	5.70%
3	8,759	4.37%	5.33%
4	7,859	4.21%	5.15%
5	6,778	4.13%	5.18%
6	5,414	4.14%	5.14%
7	5,093	4.00%	5.11%
8	4,712	4.11%	5.13%
9	5,819	3.92%	5.05%
Total	64,980		

Age Group	Number	Salary Increases for More than 10 Years of Service	
		Actual	Expected
25-29	71	3.77%	4.52%
30-34	3,717	4.78%	5.11%
35-39	9,983	4.52%	4.92%
40-44	11,678	3.74%	4.66%
45-49	14,449	3.05%	4.40%
50-54	14,653	2.32%	3.89%
55-59	14,788	2.06%	3.55%
60-64	11,119	1.76%	3.15%
65 & Over	5,776	1.22%	3.15%
Total	86,234		

Total Payroll Growth			
	2018	2017	2016
Actual	1.06%	2.30%	0.77%
Assumed	3.15%	3.20%	3.20%

**Active Members Who Retired with
Retirement Benefits (Unreduced or Reduced)
During the Year Ended June 30, 2018
State Only**

Ages	Male		Female		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 50	80	93	51	36	131	129
50	22	18	16	12	38	30
51	28	18	21	13	49	31
52	26	20	33	26	59	46
53	20	17	38	34	58	51
54	26	23	58	42	84	65
55	45	37	92	75	137	112
56	39	29	106	86	145	115
57	31	34	106	91	137	125
58	53	36	114	97	167	133
59	54	41	138	108	192	149
60	48	48	172	154	220	202
61	60	60	206	186	266	246
62	182	151	467	490	649	641
63	108	114	402	347	510	461
64	94	91	257	278	351	369
65	97	90	297	265	394	355
66	98	98	344	267	442	365
67	81	73	200	162	281	235
68	56	46	131	117	187	163
69	48	43	124	90	172	133
70	48	50	70	79	118	129
71	32	30	79	59	111	89
72	14	16	40	30	54	46
73	22	18	36	29	58	47
74	13	14	19	17	32	31
75 & Over	52	250	64	362	116	612
Totals	1,477	1,558	3,681	3,552	5,158	5,110

Beginning of Year Average for Those Who Retired						
	Male		Female		Total	
Age	61.8	years	62.8	years	62.5	years
Service	26.6	years	26.0	years	26.2	years

**Active Members Who Retired with
Disability Benefits
During the Year Ended June 30, 2018
State Only**

Ages	Male		Female		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 25	0	1	0	0	0	1
25-29	1	4	1	3	2	7
30-34	3	8	3	7	6	15
35-39	3	10	6	12	9	22
40-44	5	15	13	21	18	36
45-49	15	25	28	42	43	67
50-54	26	32	49	69	75	101
55-59	27	36	94	100	121	136
60-64	15	29	61	70	76	99
65-69	9	11	8	20	17	31
70-74	5	3	1	5	6	8
75 and over	2	0	1	0	3	0
Totals	111	174	265	349	376	523

Beginning of Year Average for Those Who Became Disabled						
	Male		Female		Total	
Age	54.2	years	54.4	years	54.3	years
Service	16.8	years	18.3	years	17.8	years

**Active Members Who Left Active Status with a
Deferred Benefit (Payments Beginning at a Later Age)
During the Year Ended June 30, 2018
State Only**

Ages	Male		Female		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 25	0	0	3	0	3	0
25-29	11	9	40	18	51	27
30-34	98	74	398	207	496	281
35-39	138	85	384	219	522	304
40-44	91	80	285	204	376	284
45-49	112	87	396	211	508	298
50-54	92	78	316	182	408	260
55-59	70	26	239	81	309	107
60-64	52	11	118	26	170	37
65-69	15	0	20	0	35	0
70-74	5	0	6	0	11	0
75 and over	3	0	3	0	6	0
Totals	687	450	2,208	1,148	2,895	1,598

Beginning of Year Average for Those Who Terminated With a Deferred Benefit						
	Male		Female		Total	
Age	45.3	years	44.2	years	44.5	years
Service	12.1	years	10.9	years	11.2	years

**Active Members Who Left Active Status with
No Benefit Payable (Contributions Refunded)
During the Year Ended June 30, 2018
State Only**

Ages	Male		Female		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 25	144	96	282	255	426	351
25-29	483	394	1,297	1,019	1,780	1,413
30-34	397	309	1,048	701	1,445	1,010
35-39	273	215	655	521	928	736
40-44	226	156	499	424	725	580
45-49	168	157	496	445	664	602
50-54	167	136	356	345	523	481
55-59	108	104	258	249	366	353
60-64	94	73	175	131	269	204
65-69	51	30	60	41	111	71
70-74	23	9	19	10	42	19
75 and over	4	0	6	0	10	0
Totals	2,138	1,679	5,151	4,141	7,289	5,820

Beginning of Year Average for Those Who Terminated and Refunded						
	Male		Female		Total	
Age	38.3	years	37.3	years	37.6	years
Service	4.4	years	4.5	years	4.5	years

Does not include members that died while in active status.

**Comparison of Actual to Expected Deaths
Among Retired Lives
During the Year Ended June 30, 2018
State Only**

Ages	Male			Female			Total		
	Actual	Expected	Exposure	Actual	Expected	Exposure	Actual	Expected	Exposure
Under 50	17	8	881	12	7	821	29	14	1,702
50-54	56	12	1,312	13	12	1,189	69	24	2,501
55-59	104	25	2,270	40	27	3,127	144	52	5,397
60-64	171	56	4,643	128	83	10,351	299	139	14,994
65-69	303	141	9,710	321	220	22,784	624	362	32,494
70-74	324	209	10,106	267	293	20,336	591	502	30,442
75-79	220	202	6,186	302	293	12,420	522	496	18,606
80-84	172	217	3,885	322	306	7,664	494	523	11,549
85-89	186	215	2,273	355	333	4,824	541	547	7,097
90-94	132	129	819	316	281	2,379	448	410	3,198
95-99	37	39	161	150	135	714	187	174	875
100 & Over	9	7	20	30	29	101	39	36	121
Totals	1,731	1,260	42,266	2,256	2,019	86,710	3,987	3,279	128,976

SECTION V

HISTORICAL GASB No. 25 AND No. 27 INFORMATION

GASB Statements No. 67 and No. 68 are the accounting standards which replaced GASB Statements No. 25 and 27. GASB Statement No. 67 is first effective for fiscal year 2014 and GASB Statement No. 68 is first effective for fiscal year 2015. A separate GASB Statements No. 67 and No. 68 report has been issued outside of this report. This section contains historical GASB Statements No. 25 and No. 27 reporting information for prior fiscal years and illustrative information for fiscal year 2015 and after.

Schedule of Funding Progress (State and Municipal) (\$ in Thousands)

Actuarial Valuation Date June 30,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Payroll (c)	UAAL as a Percentage of Payroll [(b - a) / c]
2009	\$ 34,284,569	\$ 52,729,171	\$ 18,444,603	65.02%	\$ 10,714,241	172%
2010	34,688,346	54,085,081	19,396,735	64.14%	10,657,944	182%
2011	36,177,656	55,917,543	19,739,887	64.70%	10,478,800	188%
2012	37,248,401	57,869,145	20,620,745	64.37%	10,336,537	199%
2013	39,350,969	60,060,091	20,709,122	65.52%	10,477,544	198%
2014	42,996,957	62,610,194	19,613,237	68.67%	10,803,632	182%
2015	46,170,624	66,281,781	20,111,157	69.66%	11,063,962	182%
2016	47,803,679	67,781,924	19,978,245	70.53%	11,155,924	179%
2017	50,250,465	69,986,576	19,736,111	71.80%	11,418,973	173%
2018	52,586,536	72,574,689	19,988,153	72.46%	11,566,220	173%

The figures for fiscal years prior to 2015 were applicable for both funding and accounting purposes under GASB Statements 25 and 27. The figures shown for fiscal year 2015 and after are applicable for funding purposes only. Accounting figures under GASB Statements 67 and 68 for fiscal year 2015 and after are shown in a separate report.

Schedule of Funding Progress (\$ in Thousands)

Teachers' Combined System

Actuarial Valuation Date June 30,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Payroll (c)	UAAL as a Percentage of Payroll [(b - a) / c]
2002	\$ 19,424,000	\$ 21,117,047	\$ 1,693,047	91.98%	\$ 4,323,054	39%
2003	19,626,676	21,152,063	1,525,387	92.79%	4,522,202	34%
2004	20,155,415	21,724,178	1,568,764	92.78%	4,543,444	35%
2005	20,801,529	23,305,198	2,503,669	89.26%	4,867,396	51%
2006	21,575,451	25,617,484	4,042,033	84.22%	5,269,185	77%
2007	22,814,760	28,122,575	5,307,815	81.13%	5,709,765	93%
2008	23,784,404	29,868,705	6,084,301	79.63%	6,117,590	99%
2009	20,605,618	31,172,917	10,567,299	66.10%	6,194,734	171%
2010	20,908,149	31,963,421	11,055,272	65.41%	6,254,648	177%
2011	21,868,875	32,985,145	11,116,270	66.30%	6,196,976	179%
2012	22,523,978	34,252,715	11,728,737	65.76%	6,080,603	193%
2013	23,845,618	35,530,441	11,684,823	67.11%	6,185,176	189%
2014	26,067,577	36,882,587	10,815,010	70.68%	6,310,253	171%
2015	27,995,476	38,934,459	10,938,983	71.90%	6,470,706	169%
2016	29,020,809	39,934,125	10,913,316	72.67%	6,611,038	165%
2017	30,500,873	41,198,985	10,698,113	74.03%	6,780,838	158%
2018	31,945,910	42,739,562	10,793,652	74.75%	6,941,097	156%

The figures for fiscal years prior to 2015 were applicable for both funding and accounting purposes under GASB Statements 25 and 27. The figures shown for fiscal year 2015 and after are applicable for funding purposes only. Accounting figures under GASB Statements 67 and 68 for fiscal year 2015 and after are shown in a separate report.

Schedule of Funding Progress (\$ in Thousands)

Employees' Combined System (State and Municipal)

Actuarial Valuation Date June 30,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Payroll (c)	UAAL as a Percentage of Payroll [(b - a) / c]
2002	\$ 11,162,265	\$ 11,385,749	\$ 223,484	98.04%	\$ 3,356,671	7%
2003	11,244,008	12,083,197	839,189	93.05%	3,424,054	25%
2004	11,514,655	12,621,578	1,106,923	91.23%	3,337,543	33%
2005	11,855,673	13,671,756	1,816,083	86.72%	3,537,602	51%
2006	12,287,942	15,291,091	3,003,149	80.36%	3,793,125	79%
2007	13,026,321	16,385,823	3,359,502	79.50%	4,016,221	84%
2008	13,599,717	17,609,769	4,010,052	77.23%	4,165,013	96%
2009	11,839,115	18,517,486	6,678,371	63.93%	4,249,536	157%
2010	11,937,944	19,009,788	7,071,844	62.80%	4,137,474	171%
2011	12,387,810	19,722,264	7,334,453	62.81%	4,027,810	182%
2012	12,667,592	20,283,028	7,615,436	62.45%	3,998,475	190%
2013	13,326,586	21,046,733	7,720,147	63.32%	4,030,261	192%
2014	14,547,390	22,059,765	7,512,375	65.95%	4,214,981	178%
2015	15,615,327	23,402,850	7,787,524	66.72%	4,300,748	181%
2016	16,130,438	23,817,251	7,686,814	67.73%	4,245,333	181%
2017	16,939,887	24,579,830	7,639,943	68.92%	4,319,053	177%
2018	17,679,888	25,462,497	7,782,609	69.44%	4,301,247	181%

The figures for fiscal years prior to 2015 were applicable for both funding and accounting purposes under GASB Statements 25 and 27. The figures shown for fiscal year 2015 and after are applicable for funding purposes only. Accounting figures under GASB Statements 67 and 68 for fiscal year 2015 and after are shown in a separate report.

Schedule of Funding Progress (\$ in Thousands)

State Police

Actuarial Valuation Date June 30,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Payroll (c)	UAAL as a Percentage of Payroll [(b - a) / c]
2002	\$ 1,300,402	\$ 1,030,575	\$ (269,827)	126.18%	\$ 83,142	-325%
2003	1,285,201	1,062,383	(222,818)	120.97%	80,839	-276%
2004	1,287,981	1,200,605	(87,376)	107.28%	76,445	-114%
2005	1,289,345	1,284,950	(4,395)	100.34%	76,463	-6%
2006	1,301,877	1,325,875	23,998	98.19%	80,649	30%
2007	1,334,375	1,516,935	182,560	87.97%	83,191	219%
2008	1,343,208	1,601,576	258,367	83.87%	86,464	299%
2009	1,119,766	1,710,356	590,591	65.47%	85,586	690%
2010	1,085,281	1,722,564	637,283	63.00%	81,705	780%
2011	1,090,383	1,759,676	669,293	61.96%	75,551	886%
2012	1,134,511	1,826,546	692,035	62.11%	77,690	891%
2013	1,164,217	1,882,501	718,284	61.84%	79,848	900%
2014	1,241,758	1,966,572	724,814	63.14%	85,660	846%
2015	1,314,315	2,103,134	788,819	62.49%	91,050	866%
2016	1,344,163	2,124,786	780,623	63.26%	93,491	835%
2017	1,408,754	2,198,337	789,583	64.08%	100,384	787%
2018	1,468,641	2,250,699	782,058	65.25%	100,325	780%

The figures for fiscal years prior to 2015 were applicable for both funding and accounting purposes under GASB Statements 25 and 27. The figures shown for fiscal year 2015 and after are applicable for funding purposes only. Accounting figures under GASB Statements 67 and 68 for fiscal year 2015 and after are shown in a separate report.

Schedule of Funding Progress (\$ in Thousands)

Judges

Actuarial Valuation Date June 30,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Payroll (c)	UAAL as a Percentage of Payroll [(b - a) / c]
2002	\$ 234,558	\$ 267,532	\$ 32,974	87.67%	\$ 31,824	104%
2003	240,208	279,008	38,801	86.09%	33,169	117%
2004	250,272	312,285	62,013	80.14%	32,937	188%
2005	260,125	328,033	67,908	79.30%	33,074	205%
2006	273,679	352,537	78,858	77.63%	35,939	219%
2007	293,052	371,987	78,936	78.78%	37,638	210%
2008	306,716	406,782	100,066	75.40%	37,943	264%
2009	270,870	421,039	150,169	64.33%	40,266	373%
2010	276,643	426,215	149,572	64.91%	39,961	374%
2011	293,801	433,240	139,439	67.81%	38,810	359%
2012	330,154	421,286	91,132	78.37%	39,955	228%
2013	354,900	438,836	83,937	80.87%	40,001	210%
2014	389,072	459,447	70,375	84.68%	42,313	166%
2015	416,547	511,390	94,844	81.45%	44,613	213%
2016	430,563	523,929	93,365	82.18%	44,711	209%
2017	453,134	535,902	82,768	84.56%	46,876	177%
2018	477,006	556,746	79,740	85.68%	47,498	168%

The figures for fiscal years prior to 2015 were applicable for both funding and accounting purposes under GASB Statements 25 and 27. The figures shown for fiscal year 2015 and after are applicable for funding purposes only. Accounting figures under GASB Statements 67 and 68 for fiscal year 2015 and after are shown in a separate report.

Schedule of Funding Progress (\$ in Thousands)

LEOPS (State and Municipal)

Actuarial Valuation Date June 30,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Payroll (c)	UAAL as a Percentage of Payroll [(b - a) / c]
2002	\$ 191,100	\$ 312,058	\$ 120,958	61.24%	\$ 65,916	184%
2003	225,111	382,287	157,176	58.89%	69,470	226%
2004	271,587	454,815	183,228	59.71%	77,369	237%
2005	310,087	537,736	227,648	57.67%	87,220	261%
2006	352,416	649,826	297,410	54.23%	106,669	279%
2007	414,153	738,549	324,396	56.08%	122,015	266%
2008	465,386	748,005	282,619	62.22%	133,445	212%
2009	441,827	895,099	453,273	49.36%	140,071	324%
2010	471,728	950,236	478,508	49.64%	140,199	341%
2011	526,807	1,002,708	475,900	52.54%	135,177	352%
2012	580,826	1,070,087	489,261	54.28%	135,185	362%
2013	642,678	1,143,154	500,476	56.22%	137,613	364%
2014	732,333	1,222,137	489,804	59.92%	145,673	336%
2015	808,436	1,308,633	500,197	61.78%	151,955	329%
2016	855,997	1,359,432	503,434	62.97%	156,396	322%
2017	924,705	1,449,365	524,660	63.80%	166,561	315%
2018	990,564	1,539,168	548,604	64.36%	170,555	322%

The figures for fiscal years prior to 2015 were applicable for both funding and accounting purposes under GASB Statements 25 and 27. The figures shown for fiscal year 2015 and after are applicable for funding purposes only. Accounting figures under GASB Statements 67 and 68 for fiscal year 2015 and after are shown in a separate report.

Schedule of Funding Progress (\$ in Thousands)

CORS

Actuarial Valuation Date June 30,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Payroll (c)	UAAL as a Percentage of Payroll [(b - a) / c]
2010	\$ 8,601	\$ 12,858	\$ 4,257	66.89%	\$ 3,956	108%
2011	9,980	14,511	4,531	68.78%	4,475	101%
2012	11,341	15,483	4,143	73.24%	4,628	90%
2013	16,971	18,426	1,456	92.10%	4,646	31%
2014	18,827	19,685	859	95.64%	4,752	18%
2015	20,523	21,313	790	96.29%	4,890	16%
2016	21,709	22,401	692	96.91%	4,954	14%
2017	23,112	24,157	1,044	95.68%	5,262	20%
2018	24,527	26,017	1,490	94.27%	5,498	27%

The figures for fiscal years prior to 2015 were applicable for both funding and accounting purposes under GASB Statements 25 and 27. The figures shown for fiscal year 2015 and after are applicable for funding purposes only. Accounting figures under GASB Statements 67 and 68 for fiscal year 2015 and after are shown in a separate report.

Schedule of Employer Contributions (State and Municipal)

(\$ in Thousands)

Fiscal Year Ended June 30,	Annual Required Contributions	Actual Contributions	Percentage Contributed
2009	\$ 1,313,560	\$ 1,109,564	84%
2010	1,519,980	1,308,920	86%
2011	2,035,401	1,512,473	74%
2012	2,146,624	1,521,761	71%
2013	2,149,985	1,643,101	76%
2014	2,320,991	1,733,652	75%
2015	2,107,731	1,858,613	88%
2016	1,948,082	1,870,655	96%
2017	2,033,311	2,033,311	100%
2018	1,995,018	1,995,018	100%

The Annual Required Contribution "ARC" was an accounting term defined in GASB Statements 25 and 27 and is no longer applicable for fiscal year 2015 and after. The amount for fiscal year 2015 and after was calculated in the same manner as the previous years, but is not used under the current accounting standards GASB Statements 67 and 68. For Fiscal Years 2017 and after the employer contribution is based on the actuarially determined contribution as a percent of payroll, therefore, the required and actual contributions are equal.

Schedule of Employer Contributions by System (State and Municipal) (\$ in Thousands)

	Fiscal Year Ended June 30,	Annual Required Contributions	Actual Contributions	Percentage Contributed
Teachers' Combined System	2014	\$ 1,358,991	\$ 1,000,192	74%
	2015	1,189,318	1,063,763	89%
	2016	1,112,989	1,084,049	97%
	2017	1,137,472	1,137,472	100%
	2018	1,122,986	1,122,986	100%
Employees' Combined System	2014	812,206	591,747	73%
	2015	766,239	642,676	84%
	2016	688,920	640,433	93%
	2017	730,028	730,028	100%
	2018	706,693	706,693	100%
State Police	2014	64,325	56,244	87%
	2015	76,057	76,057	100%
	2016	72,320	72,320	100%
	2017	83,000	83,000	100%
	2018	80,241	80,241	100%
Judges	2014	21,109	21,109	100%
	2015	19,028	19,028	100%
	2016	18,384	18,384	100%
	2017	21,861	21,861	100%
	2018	22,465	22,465	100%
LEOPS	2014	63,923	63,923	100%
	2015	56,546	56,546	100%
	2016	54,959	54,959	100%
	2017	60,472	60,472	100%
	2018	62,131	62,131	100%
CORS (Muni)	2014	437	437	100%
	2015	543	543	100%
	2016	510	510	100%
	2017	478	478	100%
	2018	501	501	100%
Total State	2014	2,179,715	1,592,376	73%
	2015	1,983,742	1,734,624	87%
	2016	1,837,721	1,760,294	96%
	2017	1,924,203	1,924,203	100%
	2018	1,879,141	1,879,141	100%
Total Municipal	2014	141,276	141,276	100%
	2015	123,989	123,989	100%
	2016	110,361	110,361	100%
	2017	109,108	109,108	100%
	2018	115,876	115,876	100%

The Annual Required Contribution "ARC" was an accounting term defined in GASB Statements 25 and 27 and is no longer applicable for fiscal year 2015 and after. The amount for fiscal year 2015 and after was calculated in the same manner as the previous years, but is not used under the current accounting standards GASB Statements 67 and 68. For Fiscal Years 2017 and after the employer contribution is based on the actuarially determined contribution as a percent of payroll, therefore, the required and actual contributions are equal.

APPENDIX A

ACTUARIAL ASSUMPTIONS AND METHODS

Brief Summary of Actuarial Assumptions and Methods

Valuation date	June 30, 2018
Contribution Fiscal Year Ended	June 30, 2020
Actuarial cost method	Individual entry age
Amortization method for Unfunded Actuarial Accrued Liabilities (UAAL)	Level percent closed
Amorization period	25-year closed schedule ending June 30, 2039; 20 years remaining
Asset valuation method	5-year smoothed market (max. 120% and min. 80% of market value)
Actuarial assumptions:	
Investment rate of return	7.45%
Inflation	2.60% price; 3.10% wage
Projected salary increases	3.10% - 9.10%
Cost-of-living adjustments	2.23% - 3.10% for service prior to July 1, 2011.* 1.46% - 3.10% for service after June 30, 2011.*
	<i>* Based on System and provisions. See page A-2 and Appendix C for details.</i>
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2015 valuation pursuant to the 2015 Experience Study for the period July 1, 2010 to June 30, 2014.
Mortality	Various versions of the RP-2014 Mortality Tables with projected generational mortality improvements based on the MP-2014 fully generational mortality improvement scale. Please see pages A-6 and A-7 for details.

Actuarial Assumptions and Methods

Actuarial assumptions were developed in connection with a study of 2010-2014 experience in the Experience Study report dated May 21, 2015, which includes the rationale for the assumptions. The assumptions were adopted by the Board on May 21, 2015. New economic assumptions were adopted by the Board for the 2018 valuation on July 18, 2017. Actuarial assumptions are based on a combination of future expectations and historical data. Specific assumptions are shown below.

A. ACTUARIAL ASSUMPTIONS

	1. Valuation Interest Rate	2. Annual Rate of Increase in Cost of Living			3. Aggregate Payroll Growth
		Service Before 7/1/11	Service After 7/1/11		
Teachers' Retirement	7.45%	2.60%	2.60%	#	3.10%
Teachers' Pension	7.45%	2.23%	1.46%	***	3.10%
Employees' Retirement					
Regular	7.45%	2.60%	2.60%	#	3.10%
Correctional	7.45%	2.60%	1.46%	***	3.10%
Legislative	7.45%	3.10%	3.10%		3.10%
Employees' Pension	7.45%	2.23%	1.46%	*,***	3.10%
State Police Retirement	7.45%	2.60%	1.46%	***	3.10%
Judges Pension	7.45%	3.10%	3.10%		3.10%
LEOPS	7.45%	2.23%	1.46%	**,***,#	3.10%
CORS Municipal	7.45%	2.60%	1.46%	***	3.10%

* A 2.60% simple rate is applicable for municipal members of these Systems, who do not elect to be covered under the Contributory plan.

** A 2.60% simple rate is applicable for former EPS members.

*** The increase is capped at the lesser of 2.5% and increase in CPI if the most recent calendar year market value rate of return was greater than or equal to the assumed rate (currently 7.45% as approved by the Board of Trustees). The increase is capped at the lesser of 1% and increase in CPI if the market value return was less than the assumed rate of 7.45%.

For groups whose COLA is capped at 5%, a 2.58% COLA was assumed. A 2.60% COLA was assumed for groups with an unlimited COLA, 2.23% is assumed for groups that are capped at 3%.

The valuation interest rate is net of investment expenses. Administrative expenses are assumed to be paid directly by employers external to the plan assets. Price inflation is assumed to be 2.60% and wage inflation (i.e., aggregate payroll growth) is assumed to be 3.10%.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Rates of Salary Increases

Years of Service	Annual Rates of Salary Increases for First 10 Years of Service							
	Teachers' Retirement & Pension	Employees' Retirement			Employees' Pension	State Police	Judges	LEOPS
		Regular	Correctional	Legislative				
0	8.60%	6.10%	8.85%	3.10%	6.10%	6.10%	3.10%	7.10%
1	7.10%	6.35%	7.10%	3.10%	6.35%	8.60%	3.10%	6.85%
2	5.60%	5.85%	3.35%	3.10%	5.85%	9.10%	3.10%	6.10%
3	5.60%	4.85%	3.35%	3.10%	4.85%	8.85%	3.10%	4.60%
4	5.60%	4.35%	3.35%	3.10%	4.35%	5.10%	3.10%	4.60%
5	5.60%	4.35%	3.85%	3.10%	4.35%	5.10%	3.10%	4.35%
6	5.60%	4.35%	3.85%	3.10%	4.35%	5.10%	3.10%	4.35%
7	5.60%	4.35%	3.60%	3.10%	4.35%	4.35%	3.10%	4.10%
8	5.60%	4.10%	3.35%	3.10%	4.10%	4.35%	3.10%	4.10%
9	5.60%	4.10%	3.35%	3.10%	4.10%	4.35%	3.10%	4.10%

CORS Municipal assumptions were the same as shown for Employees' Retirement Correctional.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Rates of Salary Increases

Sample Ages	Annual Rates of Salary Increases for Sample Ages with 10 or More Years of Service							
	Teachers' Retirement & Pension	Employees' Retirement			Employees' Pension	State Police	Judges	LEOPS
		Regular	Correctional	Legislative				
25	5.60%	4.35%	4.10%	3.10%	4.35%	4.35%	3.10%	4.10%
30	5.35%	4.10%	3.85%	3.10%	4.10%	4.35%	3.10%	4.10%
35	5.10%	3.85%	3.60%	3.10%	3.85%	4.10%	3.10%	4.10%
40	4.85%	3.85%	3.60%	3.10%	3.85%	4.10%	3.10%	3.85%
45	4.60%	3.60%	3.60%	3.10%	3.60%	4.10%	3.10%	3.85%
50	4.10%	3.35%	3.10%	3.10%	3.35%	3.85%	3.10%	3.60%
55	3.60%	3.35%	3.10%	3.10%	3.35%	3.10%	3.10%	3.10%
60	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%
65	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%

CORS Municipal assumptions were the same as shown for Employees' Retirement Correctional.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Rates of Withdrawal

Sample Ages	Years of Service	Annual Rates of Withdrawal from Active Service													
		Teachers' Retirement & Pension		Employees' Retirement					Employees' Pension		State Police		Judges	LEOPS	
		Male	Female	Regular		Correctional		Legislative	Male	Female	Male	Female		Male	Female
				Male	Female	Male	Female						Male		
All	0	20.00%	16.00%	21.00%	20.00%	16.00%	18.00%	*	21.00%	20.00%	13.00%	13.00%	0.00%	17.00%	17.00%
	1	16.00%	12.50%	15.00%	15.00%	12.00%	16.00%	*	15.00%	15.00%	9.00%	9.00%	0.00%	10.00%	10.00%
	2	14.00%	12.00%	13.00%	13.00%	9.00%	12.00%	*	13.00%	13.00%	7.00%	7.00%	0.00%	8.50%	8.50%
	3	11.00%	9.00%	10.50%	11.00%	8.00%	10.00%	*	10.50%	11.00%	4.25%	4.25%	0.00%	7.00%	7.00%
	4	8.00%	7.75%	8.50%	9.00%	6.00%	10.00%	*	8.50%	9.00%	4.00%	4.00%	0.00%	6.00%	6.00%
	5	6.50%	6.00%	7.25%	6.50%	5.50%	8.50%	*	7.25%	6.50%	3.50%	3.50%	0.00%	5.50%	5.50%
	6	5.75%	5.50%	6.50%	6.00%	5.00%	8.00%	*	6.50%	6.00%	2.50%	2.50%	0.00%	5.00%	5.00%
	7	4.75%	4.75%	5.50%	5.25%	4.00%	7.00%	*	5.50%	5.25%	2.00%	2.00%	0.00%	4.50%	4.50%
	8	3.75%	4.00%	5.00%	4.75%	3.50%	6.00%	*	5.00%	4.75%	2.00%	2.00%	0.00%	3.50%	3.50%
	9	3.00%	3.50%	4.50%	4.00%	3.50%	5.00%	*	4.50%	4.00%	1.50%	1.50%	0.00%	3.50%	3.50%
25	10 & Over	4.00%	3.50%	4.00%	4.00%	3.00%	3.75%	*	4.00%	4.00%	1.00%	1.00%	0.00%	3.50%	3.50%
30		2.00%	2.75%	3.50%	4.00%	3.00%	3.75%	*	3.50%	4.00%	1.00%	1.00%	0.00%	2.50%	2.50%
35		1.75%	2.00%	2.75%	3.25%	3.00%	3.75%	*	2.75%	3.25%	1.00%	1.00%	0.00%	2.00%	2.00%
40		1.50%	1.75%	2.25%	2.50%	3.00%	3.75%	*	2.25%	2.50%	1.00%	1.00%	0.00%	1.75%	1.75%
45		1.50%	1.25%	2.00%	2.25%	3.00%	3.75%	*	2.00%	2.25%	1.00%	1.00%	0.00%	1.75%	1.75%
50		1.50%	1.00%	2.00%	2.00%	3.00%	3.75%	*	2.00%	2.00%	1.00%	1.00%	0.00%	1.75%	1.75%
55		1.50%	1.00%	2.00%	2.00%	3.00%	3.75%	*	2.00%	2.00%	1.00%	1.00%	0.00%	1.75%	1.75%
60		1.50%	1.00%	2.00%	2.00%	3.00%	3.75%	*	2.00%	2.00%	1.00%	1.00%	0.00%	1.75%	1.75%
65	1.50%	1.00%	2.00%	2.00%	3.00%	3.75%	*	2.00%	2.00%	1.00%	1.00%	0.00%	1.75%	1.75%	

CORS Municipal assumptions were the same as shown for Employees' Retirement Correctional.

* 20% of legislative members are assumed to withdraw after 8 years and each fourth year thereafter.

For active members of the Teachers Retirement and Pension Systems and Employees' Retirement (Regular) and Pension Systems, the probability of electing a refund upon withdrawal (if eligible for a vested benefit) is 15% upon first becoming vested, grading down to 0% upon reaching first eligibility for retirement. Active members that terminate from the other Systems that are eligible for a deferred vested benefit are assumed to leave their contributions in the plan and 100% are assumed to elect a deferred benefit.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Summary of Mortality Assumptions

	Healthy Retiree (Non-Disabled) Mortality Assumption			Pre-Retirement Mortality Assumption	
	RP 2014 Healthy Annuitant Mortality Tables with Generational Projection Using MP-2014	Year Projected to in 2014	Future Life Expectancy Age 65 (Birth Year 1953)	RP 2014 Employee Mortality Tables with Generational Projection Using MP-2014	Year Projected to in 2014
	Collar		Life Expectancy	Collar	
Teachers' Combined System					
Male	Male White Collar Annuitant Table	2012	23.05	Male White Collar Employee Table	2014
Female	Female White Collar Annuitant Table	2016	25.45	Female White Collar Employee Table	2014
Employees' Combined System					
Male	Male Blue Collar Annuitant Table	2010	20.27	Male Blue Collar Employee Table	2014
Female	Female Blue Collar Annuitant Table	2012	23.21	Female Blue Collar Employee Table	2014
State Police					
Male	Male Combined Annuitant Table	2014	21.93	Male Combined Employee Table	2014
Female	Female Combined Annuitant Table	2014	24.12	Female Combined Employee Table	2014
Judges					
Male	Male White Collar Annuitant Table	2012	23.05	Male White Collar Employee Table	2014
Female	Female White Collar Annuitant Table	2016	25.45	Female White Collar Employee Table	2014
LEOPS					
Male	Male Combined Annuitant Table	2014	21.93	Male Combined Employee Table	2014
Female	Female Combined Annuitant Table	2014	24.12	Female Combined Employee Table	2014

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Summary of Mortality Assumptions

Disabled Mortality Assumption			
	RP 2014 Disabled Annuitant Mortality Tables with no projection (static tables)		Future Life Expectancy Age 65 (Birth Year 1953)
	Collar	Set Forward	Life Expectancy
Teachers' Combined System			
Male	Male Disabled Annuitant Table	1	14.38
Female	Female Disabled Annuitant Table	0	17.45
Employees' Combined System			
Male	Male Disabled Annuitant Table	2	13.85
Female	Female Disabled Annuitant Table	3	15.55
Judges			
Male	Male Disabled Annuitant Table	1	14.38
Female	Female Disabled Annuitant Table	0	17.45
	RP 2014 Healthy Annuitant Mortality Tables with Generational Projection Using MP-2014		Future Life Expectancy Age 65 (Birth Year 1953)
	Collar	Year Projected to in 2014	Life Expectancy
State Police			
Male	Male Blue Collar Annuitant Table	2014	20.88
Female	Female Blue Collar Annuitant Table	2014	23.56
LEOPS			
Male	Male Blue Collar Annuitant Table	2014	20.88
Female	Female Blue Collar Annuitant Table	2014	23.56

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Healthy Retired Mortality

Sample Ages in 2018	Actuarial Present Value of \$1 Monthly for Life (Without COLA)											
	Teachers' Retirement & Pension		Employees' Retirement & Pension		Employees' Retirement Correctional & Legislative		State Police		Judges		LEOPS	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
50	\$149.44	\$152.44	\$144.10	\$148.95	\$144.10	\$148.95	\$146.28	\$150.18	\$149.44	\$152.44	\$146.28	\$150.18
55	143.77	147.46	137.18	143.15	137.18	143.15	140.11	144.77	143.77	147.46	140.11	144.77
60	136.38	140.79	128.57	135.66	128.57	135.66	132.43	137.64	136.38	140.79	132.43	137.64
65	126.66	132.09	117.86	126.09	117.86	126.09	122.74	128.49	126.66	132.09	122.74	128.49
70	114.37	121.08	105.12	114.26	105.12	114.26	110.82	117.10	114.37	121.08	110.82	117.10
75	99.59	107.51	90.50	100.29	90.50	100.29	96.56	103.43	99.59	107.51	96.56	103.43
80	82.66	91.64	74.59	84.64	74.59	84.64	80.37	87.75	82.66	91.64	80.37	87.75

Sample Ages in 2018	Future Life Expectancy (Years)											
	Teachers' Retirement & Pension		Employees' Retirement & Pension		Employees' Retirement Correctional & Legislative		State Police		Judges		LEOPS	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
50	37.42	40.20	33.91	37.50	33.91	37.50	35.70	38.53	37.42	40.20	35.70	38.53
55	32.50	35.17	29.16	32.58	29.16	32.58	30.92	33.60	32.50	35.17	30.92	33.60
60	27.71	30.23	24.60	27.80	24.60	27.80	26.34	28.77	27.71	30.23	26.34	28.77
65	23.05	25.45	20.27	23.21	20.27	23.21	21.93	24.12	23.05	25.45	21.93	24.12
70	18.60	20.87	16.25	18.86	16.25	18.86	17.77	19.70	18.60	20.87	17.77	19.70
75	14.48	16.57	12.59	14.86	12.59	14.86	13.89	15.60	14.48	16.57	13.89	15.60
80	10.78	12.65	9.39	11.30	9.39	11.30	10.41	11.89	10.78	12.65	10.41	11.89

CORS Municipal assumptions were the same as shown for Employees' Retirement Correctional.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Disabled Retired Mortality

Sample Ages in 2018	Actuarial Present Value of \$1 Monthly for Life (Without COLA)											
	Teachers' Retirement & Pension		Employees' Retirement & Pension		Employees' Retirement Correctional & Legislative		State Police		Judges		LEOPS	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
50	\$118.37	\$130.74	\$117.28	\$127.26	\$117.28	\$127.26	\$144.98	\$149.32	\$118.37	\$130.74	\$144.98	\$149.32
55	112.57	124.75	111.27	120.61	111.27	120.61	138.20	143.63	112.15	124.24	138.20	143.63
60	105.43	117.50	103.80	112.25	103.80	112.25	129.84	136.32	105.07	117.05	129.84	136.32
65	96.55	108.33	94.57	101.86	94.57	101.86	119.51	126.95	96.25	107.96	119.51	126.95
70	86.05	97.20	83.78	89.82	83.78	89.82	107.20	115.28	85.81	96.90	107.20	115.28
75	74.27	84.74	71.80	76.99	71.80	76.99	92.87	101.45	74.10	84.51	92.87	101.45
80	61.67	71.82	59.12	64.15	59.12	64.15	77.04	85.90	61.55	71.65	77.04	85.90

Sample Ages in 2018	Future Life Expectancy (Years)											
	Teachers' Retirement & Pension		Employees' Retirement & Pension		Employees' Retirement Correctional & Legislative		State Police		Judges		LEOPS	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
50	22.35	27.30	21.82	25.28	21.82	25.28	34.61	37.87	22.35	27.30	34.61	37.87
55	19.70	23.96	19.17	22.00	19.17	22.00	29.81	32.94	19.70	23.96	29.81	32.94
60	17.04	20.69	16.51	18.74	16.51	18.74	25.23	28.17	17.04	20.69	25.23	28.17
65	14.38	17.45	13.85	15.55	13.85	15.55	20.88	23.56	14.38	17.45	20.88	23.56
70	11.79	14.32	11.29	12.55	11.29	12.55	16.83	19.19	11.79	14.32	16.83	19.19
75	9.38	11.44	8.92	9.89	8.92	9.89	13.12	15.16	9.38	11.44	13.12	15.16
80	7.20	8.93	6.80	7.62	6.80	7.62	9.84	11.56	7.20	8.93	9.84	11.56

CORS Municipal assumptions were the same as shown for Employees' Retirement Correctional.

Actuarial Assumptions and Methods

ACTUARIAL ASSUMPTIONS

Accidental Death Mortality Rates		
State Police and LEOPS		
Sample Ages	Male	Female
20	0.0122%	0.0049%
25	0.0145%	0.0052%
30	0.0136%	0.0065%
35	0.0157%	0.0086%
40	0.0188%	0.0119%
45	0.0292%	0.0197%
50	0.0506%	0.0331%
55	0.0836%	0.0502%
60	0.1406%	0.0733%
65	0.2483%	0.1109%
70	0.4156%	0.1893%
75	0.6956%	0.3230%
80	1.1643%	0.5514%

Additional margin for future mortality improvements are included in the projection scale.

The RP-2014 tables used in the valuation were extended in order that no zero rates exist in the tables. For Annuitant tables, ages 1-17 were populated using RP-2014 Juvenile rates, ages 18-19 were populated with Employee rates, and ages 20-49 were derived using a cubic spline. For Employee tables, ages 1-17 were populated using RP-2014 Juvenile rates, ages 81-94 were derived using a cubic spline, and ages 95-120 were populated with annuitant rates.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Rates of Disability

Sample Ages	Annual Rates of Disability															
	Teachers' Retirement				Teachers' Pension				Employees' Retirement							
	Ordinary		Accidental		Ordinary		Accidental		Ordinary				Accidental			
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
25	0.0053%	0.0096%	0.0007%	0.0015%	0.0280%	0.0370%	0.0012%	0.0019%	0.0267%	0.0245%	0.1257%	0.1156%	0.0096%	0.0088%	0.1041%	0.1607%
30	0.0053%	0.0096%	0.0007%	0.0015%	0.0280%	0.0370%	0.0012%	0.0019%	0.0263%	0.0242%	0.1611%	0.1201%	0.0100%	0.0092%	0.1250%	0.1607%
35	0.0053%	0.0226%	0.0007%	0.0035%	0.0280%	0.0470%	0.0012%	0.0024%	0.0455%	0.0423%	0.2013%	0.2076%	0.0140%	0.0130%	0.1577%	0.1607%
40	0.0167%	0.0450%	0.0022%	0.0069%	0.0920%	0.0820%	0.0041%	0.0041%	0.0862%	0.0779%	0.2667%	0.3836%	0.0184%	0.0167%	0.1993%	0.1785%
45	0.0335%	0.0772%	0.0045%	0.0119%	0.1840%	0.1560%	0.0082%	0.0078%	0.1093%	0.1156%	0.3577%	0.5678%	0.0163%	0.0173%	0.2499%	0.2053%
50	0.0502%	0.1126%	0.0067%	0.0173%	0.2750%	0.2630%	0.0122%	0.0132%	0.1320%	0.1656%	0.5115%	0.8141%	0.0145%	0.0182%	0.3540%	0.2678%
55	0.0668%	0.1931%	0.0089%	0.0297%	0.3670%	0.4420%	0.0163%	0.0221%	0.1763%	0.2293%	0.6577%	1.1276%	0.0137%	0.0178%	0.4373%	0.3749%
60	0.0802%	0.1931%	0.0111%	0.0297%	0.3960%	0.3780%	0.0204%	0.0189%	0.2304%	0.3170%	0.8069%	1.5582%	0.0140%	0.0193%	0.4373%	0.3749%

Sample Ages	Annual Rates of Disability													
	Employees' Pension				State Police				Judges		LEOPS			
	Ordinary		Accidental		Ordinary		Accidental		Male	Female	Ordinary		Accidental	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
25	0.1257%	0.0781%	0.0403%	0.0212%	0.1566%	0.4860%	0.5742%	1.7820%	0.0060%	0.0111%	0.1714%	0.5161%	0.3237%	0.6256%
30	0.1611%	0.0772%	0.0423%	0.0223%	0.1996%	0.5207%	0.6098%	1.5912%	0.0060%	0.0111%	0.2197%	0.5530%	0.3458%	0.5586%
35	0.2013%	0.1335%	0.0591%	0.0312%	0.2511%	0.5254%	0.7477%	1.5652%	0.0060%	0.0260%	0.2746%	0.5580%	0.4214%	0.5494%
40	0.2667%	0.2466%	0.0776%	0.0399%	0.3332%	0.6113%	0.8653%	1.5877%	0.0190%	0.0520%	0.3637%	0.6543%	0.4867%	0.5616%
45	0.3577%	0.3650%	0.0689%	0.0414%	0.4466%	0.7443%	0.9593%	1.5991%	0.0379%	0.0891%	0.4878%	0.7933%	0.5399%	0.5636%
50	0.5167%	0.6280%	0.0613%	0.0436%	0.6383%	0.9770%	1.3405%	2.0515%	0.0569%	0.1300%	0.6578%	0.9824%	0.7546%	0.7234%
55	0.7301%	0.8046%	0.0578%	0.0426%	0.8205%	1.4919%	1.7489%	3.1797%	0.0757%	0.2228%	0.6578%	0.9824%	0.9846%	1.1204%
60	0.7402%	0.9026%	0.0591%	0.0462%	1.0065%	2.6214%	2.1617%	5.6299%	0.0947%	0.2228%	0.6578%	0.9824%	1.2174%	1.9812%

CORS Municipal assumptions were the same as shown for Employees' Retirement Correctional.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Rates of Normal Retirement

Ages	Annual Rates of Normal Retirement													
	Teachers' Retirement		Teachers' Pension				Employees' Retirement		Legislators*		Employees' Pension			
	All Years of Service		At Least 30 Years		Less Than 30 Years		All Years of Service		All Years of Service		At Least 30 Years		Less Than 30 Years	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
45	15.0%	15.0%	10.0%	9.0%			17.0%	16.0%			12.0%	11.0%		
46	15.0%	15.0%	10.0%	9.0%			17.0%	16.0%			12.0%	11.0%		
47	15.0%	15.0%	10.0%	9.0%			17.0%	16.0%			12.0%	11.0%		
48	15.0%	15.0%	10.0%	9.0%			17.0%	16.0%			12.0%	11.0%		
49	15.0%	15.0%	10.0%	9.0%			17.0%	16.0%			12.0%	11.0%		
50	15.0%	15.0%	10.0%	9.0%			10.0%	11.0%			9.0%	11.0%		
51	15.0%	15.0%	10.0%	9.0%			10.0%	11.0%			9.0%	11.0%		
52	15.0%	15.0%	10.0%	9.0%			10.0%	11.0%			9.0%	11.0%		
53	15.0%	15.0%	10.0%	9.0%			10.0%	11.0%			9.0%	11.0%		
54	15.0%	15.0%	10.0%	9.0%			10.0%	11.0%			9.0%	11.0%		
55	15.0%	15.0%	10.0%	10.0%			11.0%	13.0%			9.0%	10.0%		
56	15.0%	15.0%	10.0%	10.0%			11.0%	13.0%			9.0%	10.0%		
57	15.0%	15.0%	10.0%	10.0%			11.0%	13.0%			9.0%	10.0%		
58	15.0%	15.0%	10.0%	10.0%			11.0%	13.0%			9.0%	10.0%		
59	15.0%	15.0%	10.0%	11.0%			11.0%	13.0%			9.0%	10.0%		
60	15.0%	18.0%	13.0%	15.0%			13.0%	13.0%	10.0%	10.0%	10.0%	14.0%		
61	15.0%	18.0%	16.0%	18.0%			15.0%	18.0%	10.0%	10.0%	13.0%	14.0%		
62	28.0%	25.0%	25.0%	25.0%	14.0%	21.0%	27.0%	22.0%	10.0%	10.0%	25.0%	28.0%	16.0%	18.0%
63	23.0%	20.0%	23.0%	23.0%	14.0%	16.0%	23.0%	22.0%	10.0%	10.0%	23.0%	24.0%	13.0%	16.0%
64	20.0%	20.0%	19.0%	23.0%	14.0%	16.0%	19.0%	22.0%	10.0%	10.0%	18.0%	20.0%	13.0%	14.0%
65	20.0%	25.0%	25.0%	25.0%	16.0%	18.0%	20.0%	22.0%	30.0%	30.0%	17.0%	20.0%	13.0%	16.0%
66	20.0%	25.0%	25.0%	25.0%	16.0%	22.0%	25.0%	25.0%	30.0%	30.0%	25.0%	25.0%	18.0%	18.0%
67	20.0%	20.0%	20.0%	25.0%	16.0%	20.0%	25.0%	22.0%	30.0%	30.0%	25.0%	22.0%	16.0%	17.0%
68	20.0%	18.0%	20.0%	25.0%	16.0%	18.0%	18.0%	22.0%	30.0%	30.0%	18.0%	22.0%	14.0%	15.0%
69	20.0%	18.0%	20.0%	25.0%	16.0%	18.0%	18.0%	22.0%	30.0%	30.0%	18.0%	18.0%	14.0%	15.0%
70	20.0%	18.0%	25.0%	25.0%	16.0%	20.0%	20.0%	20.0%	35.0%	35.0%	22.0%	22.0%	16.0%	18.0%
71	15.0%	18.0%	25.0%	25.0%	16.0%	20.0%	20.0%	20.0%	35.0%	35.0%	22.0%	20.0%	13.0%	15.0%
72	15.0%	18.0%	25.0%	25.0%	16.0%	15.0%	20.0%	20.0%	35.0%	35.0%	22.0%	20.0%	13.0%	15.0%
73	15.0%	18.0%	25.0%	25.0%	16.0%	15.0%	20.0%	20.0%	35.0%	35.0%	22.0%	20.0%	13.0%	15.0%
74	15.0%	18.0%	25.0%	25.0%	16.0%	15.0%	20.0%	20.0%	35.0%	35.0%	22.0%	20.0%	13.0%	15.0%
75 & Over	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* Retirement rates for Legislative members are assumed to apply every four years to members eligible for retirement (beginning with the year ending June 30, 2015, and each fourth year thereafter).

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Rates of Normal Retirement

Ages	Annual Rates of Normal Retirement													
	Correctional Officers				State Police *				Judges		LEOPS			
	At Least 20 Years		Less Than 20 Years		At Least 22 Years		Less Than 22 Years		All Years of Service		At Least 25 Years		Less Than 25 Years	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
40	23.0%	23.0%			25.0%	25.0%					40.0%	40.0%		
41	18.0%	18.0%			25.0%	25.0%					40.0%	40.0%		
42	18.0%	18.0%			30.0%	30.0%					40.0%	40.0%		
43	16.0%	16.0%			30.0%	30.0%					40.0%	40.0%		
44	16.0%	16.0%			35.0%	35.0%					40.0%	40.0%		
45	15.0%	15.0%			35.0%	35.0%					36.0%	36.0%		
46	14.0%	14.0%			35.0%	35.0%					36.0%	36.0%		
47	14.0%	14.0%			35.0%	35.0%					36.0%	36.0%		
48	13.0%	13.0%			35.0%	35.0%					36.0%	36.0%		
49	13.0%	13.0%			35.0%	35.0%					36.0%	36.0%		
50	13.0%	13.0%			30.0%	30.0%	10.0%	10.0%			32.0%	32.0%	5.0%	5.0%
51	12.0%	12.0%			30.0%	30.0%	10.0%	10.0%			32.0%	32.0%	5.0%	5.0%
52	12.0%	12.0%			30.0%	30.0%	10.0%	10.0%			32.0%	32.0%	5.0%	5.0%
53	12.0%	12.0%			30.0%	30.0%	10.0%	10.0%			20.0%	20.0%	5.0%	5.0%
54	12.0%	12.0%			30.0%	30.0%	10.0%	10.0%			25.0%	25.0%	5.0%	5.0%
55	12.0%	12.0%	4.5%	4.5%	35.0%	35.0%	15.0%	15.0%			23.0%	23.0%	5.0%	5.0%
56	11.0%	11.0%	4.5%	4.5%	35.0%	35.0%	15.0%	15.0%			23.0%	23.0%	5.0%	5.0%
57	11.0%	11.0%	4.5%	4.5%	35.0%	35.0%	15.0%	15.0%			23.0%	23.0%	5.0%	5.0%
58	11.0%	11.0%	4.5%	4.5%	35.0%	35.0%	15.0%	15.0%			23.0%	23.0%	5.0%	5.0%
59	11.0%	11.0%	4.5%	4.5%	35.0%	35.0%	15.0%	15.0%			18.0%	18.0%	5.0%	5.0%
60	11.0%	11.0%	4.5%	4.5%	100.0%	100.0%	100.0%	100.0%	8.0%	15.0%	23.0%	23.0%	8.0%	8.0%
61	13.0%	13.0%	4.5%	4.5%					8.0%	10.0%	23.0%	23.0%	8.0%	8.0%
62	30.0%	30.0%	12.0%	12.0%					8.0%	10.0%	30.0%	30.0%	15.0%	15.0%
63	30.0%	30.0%	12.0%	12.0%					8.0%	10.0%	30.0%	30.0%	15.0%	15.0%
64	20.0%	20.0%	12.0%	12.0%					8.0%	10.0%	30.0%	30.0%	15.0%	15.0%
65	30.0%	30.0%	12.0%	12.0%					8.0%	10.0%	50.0%	50.0%	50.0%	50.0%
66	30.0%	30.0%	25.0%	25.0%					10.0%	15.0%	50.0%	50.0%	50.0%	50.0%
67	30.0%	30.0%	20.0%	20.0%					10.0%	15.0%	50.0%	50.0%	50.0%	50.0%
68	30.0%	30.0%	20.0%	20.0%					10.0%	15.0%	50.0%	50.0%	50.0%	50.0%
69	30.0%	30.0%	20.0%	20.0%					15.0%	20.0%	50.0%	50.0%	50.0%	50.0%
70 & Over	100.0%	100.0%	100.0%	100.0%					100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* 50% of participants are expected to elect DROP participation.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Rates of Normal Retirement

Ages	Additional Rates to Add to Annual Rates of Normal Retirement at Age of First Eligibility							
	Teachers' Pension Reformed				Employees' Pension Reformed			
	At Least 30 Years		Less Than 30 Years		At Least 30 Years		Less Than 30 Years	
	Male	Female	Male	Female	Male	Female	Male	Female
55 and Under	33.0%	30.0%			35.0%	35.0%		
56	26.0%	23.0%			28.0%	28.0%		
57	19.0%	17.0%			21.0%	21.0%		
58	11.0%	9.0%			14.0%	14.0%		
59	2.0%	1.0%			7.0%	7.0%		
60	0.0%	0.0%			0.0%	0.0%		
61	0.0%	0.0%			0.0%	0.0%		
62	0.0%	0.0%			0.0%	0.0%		
63	0.0%	0.0%			0.0%	0.0%		
64	0.0%	0.0%			0.0%	0.0%		
65+	0.0%	0.0%	20.0%	15.0%	0.0%	0.0%	25.0%	25.0%

State Police Reformed: Add additional 20% to annual rate at age of first eligibility if under age 50.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Rates of Early Retirement

Ages	Annual Rates of Early Retirement *											
	Teachers' Retirement		Teachers' Pension				Employees' Retirement		Employees' Pension			
			Non-Reformed		Reformed				Non-Reformed		Reformed	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
40	5.0%	5.0%					5.0%	5.0%				
41	5.0%	5.0%					5.0%	5.0%				
42	5.0%	5.0%					5.0%	5.0%				
43	5.0%	5.0%					5.0%	5.0%				
44	5.0%	5.0%					5.0%	5.0%				
45	5.0%	5.0%					5.0%	5.0%				
46	5.0%	5.0%					5.0%	5.0%				
47	5.0%	5.0%					5.0%	5.0%				
48	5.0%	5.0%					5.0%	5.0%				
49	5.0%	5.0%					5.0%	5.0%				
50	5.0%	5.0%					5.0%	5.0%				
51	5.0%	5.0%					5.0%	5.0%				
52	5.0%	5.0%					5.0%	5.0%				
53	5.0%	5.0%					5.0%	5.0%				
54	5.0%	5.0%					5.0%	5.0%				
55	10.0%	10.0%	1.5%	2.0%			5.0%	5.0%	2.0%	2.0%		
56	5.0%	5.0%	1.5%	2.5%			5.0%	5.0%	1.5%	2.5%		
57	5.0%	5.0%	1.5%	3.0%			5.0%	5.0%	2.0%	2.5%		
58	5.0%	5.0%	2.5%	3.0%			5.0%	5.0%	2.0%	3.0%		
59	5.0%	5.0%	3.5%	3.5%			5.0%	5.0%	2.5%	3.0%		
60			3.5%	5.0%	8.0%	12.5%			4.0%	4.5%	9.5%	11.5%
61			6.5%	7.0%	6.5%	7.0%			6.0%	5.5%	6.0%	5.5%
62					7.0%	7.5%					6.5%	6.0%
63					7.5%	8.0%					7.0%	6.5%
64					8.0%	8.5%					7.5%	7.0%

* Divisions without early retirement eligibility are not shown.

Actuarial Assumptions and Methods

A. ACTUARIAL ASSUMPTIONS

Social Security Covered Compensation

Teachers' Retirement	Not applicable
Teachers' Pension	Future covered compensation levels, used to estimate member contributions and retirement allowances, were calculated using a 3.10% per annum compounded increase in the 2018 Social Security Maximum Taxable Wage Base.
Employees' Retirement	Not applicable
Employees' Pension	Future covered compensation levels, used to estimate member contributions and retirement allowances, were calculated using a 3.10% per annum compounded increase in the 2018 Social Security Maximum Taxable Wage Base.
State Police Retirement	Not applicable
Judges' Pension	Not applicable
LEOPS	Future covered compensation levels, used to estimate member contributions and retirement allowances, were calculated using a 3.10% per annum compounded increase in the 2018 Social Security Maximum Taxable Wage Base.
Correctional Officers' Retirement System	Not applicable

Actuarial Assumptions and Methods

B. ACTUARIAL PROCEDURES

1. Asset Valuation Method

All six Systems use a method based on the principle that the difference between actual and expected investment returns should be subject to partial recognition to smooth out fluctuations in the total return achieved by the fund from year to year. Under this method, the actuarial value of assets reflects annually one-fifth of the market value gains or losses for the five prior years. The resulting value is restricted to be not less than 80% of market value nor greater than 120% of market value. As of June 30, 2007, the calculation of market gains or losses included the difference between market and actuarial assets as of June 30, 2006.

For the Employees' Retirement and Pension System and for LEOPS, assets must be allocated between State and Municipal Corporation members. Beginning July 1, 1984, this allocation is based upon actual cash flows and shared investment results.

Actuarial Assumptions and Methods

B. ACTUARIAL PROCEDURES

2. Funding Method

All six Systems use the individual entry age normal method to determine costs. Under this funding method, a total contribution rate is determined which consists of two elements, the normal cost rate and the Unfunded Actuarial Liability (UAL) rate.

The individual Entry Age Normal cost rate is determined as the value, as of age at entry into the plan, of the member's projected future benefits, and divided by the value, also as of the member's entry age, of the member's expected future salary. For purposes of calculating the normal cost rate, the same benefit accrual rates used to calculate the present value of future benefits are used to calculate the normal cost. The benefit provisions applicable to each member are used in developing his/her individual normal cost rate.

In addition to contributions required to meet the System's normal cost, contributions will be required to fund the System's unfunded actuarial liability. Actuarial liability is defined as the present value of future benefits less the present value of future normal costs. The unfunded actuarial liability for all members is the actuarial liability less the actuarial value of the System's assets.

The System's unfunded actuarial liability is funded over a 25-year closed amortization period ending June 30, 2039 (20 years remaining as of June 30, 2018) as a level percentage of payroll.

There is an additional component in the Unfunded Actuarial Accrued Liability amortization contribution rate that accounts for the effects of the lag between the valuation date and when the contribution is made. This calculation assumes the contributions that would be received in fiscal year 2019 are equal to the budgeted contributions developed in the valuation as of June 30, 2017, plus the proportionate share of reinvested savings allocated to each System for fiscal year 2019 under the pension reforms.

A portion of the savings from the 2011 pension reforms passed by the General Assembly are to be reinvested as additional contributions into the Systems. Beginning in fiscal year 2016, \$75 million of additional contributions are to be reinvested each year until the combined System reaches 85% funded.

Summary of Assumptions Used

June 30, 2018

Miscellaneous and Technical Assumptions

Marriage Assumption:	100% of males and females are assumed to be married for purposes of death-in-service benefits; 75% of males and females are assumed to be married for purposes of post-retirement death benefits.
Pay Increase Timing:	Teachers' Systems assume beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date. All other Systems assume middle of (Fiscal) year. This is equivalent to assuming that reported pays represent the annualized rate of pay at the beginning of the (Fiscal) year.
Decrement Timing:	Decrements of all types are assumed to occur mid-year, except for Teachers' Systems which assumed beginning of year (i.e., July 1) for retirement and termination.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and rounded integer service on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Decrement Operation:	Mortality and disability operate during retirement eligibility.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. New entrant normal cost contributions are applied to the funding of new entrant benefits.
Unused Sick Leave:	Each member is assumed to have an additional 5 months of service at retirement attributable to sick leave.
Unknown Data for Participants:	Average characteristics of the group as a whole are used to fill in the unknown data.
Age of Spouse:	In the absence of complete data, females are assumed to be 4 years younger than males.
Option Elections:	It was assumed optional forms of payment were actuarially equivalent to the normal form of payment.
Actuarial Equivalence:	
TCS, ECS, & Judges	5.85% interest, RP 2014 Combined Annuitant Mortality, 50% Unisex, 2.29% COLA pre-reform, 1.49% COLA post-reform

Summary of Assumptions Used

June 30, 2018

Miscellaneous and Technical Assumptions

State Police & LEOPS 5.85% interest, RP 2014 Combined Annuitant Mortality, 85% Unisex, 2.46% COLA pre-reform, 1.49% COLA post-reform.

Reinvested Savings Allocation: Total savings from the 2011 pension reforms that are to be reinvested in each of the Systems as additional contributions are allocated between the Systems in proportion to the savings as measured in the actuarial valuation as of June 30, 2011.

Vested Deferred Benefit Commencement: Active members assumed to terminate with a vested benefit, current vested deferred, and inactive members are assumed to commence receiving benefits at the following ages:

- Correctional Officers: Age 55*
- Employees' and Teachers' Retirement, Judges, and Legislators: Age 60*
- Employees' and Teachers' Pension: Age 62 or age 55 if the member has at least 15 years of service*
- Employees' and Teachers' Pension Reformed: Age 65 or age 60 if the member has at least 15 years of service*
- LEOPS and State Police: Age 50*

Liability Adjustments: An additional liability was added to the aggregate results for Teachers' and Employees' Pension Systems to reflect that the past service benefits would be calculated based on the full-time salary equivalent for part-time members. The additional liability amounts are \$207,204,000 for TPS and \$45,950,000 for EPS state.

For State Police and LEOPS, the value of the 4% DROP interest credits compared to the valuation interest rate of 7.45% was accounted for through the use of certain load factors as shown in the table below. The assumed length of time members would stay in the DROP was 4.81 years for State Police and 4.82 years for LEOPS, based on the average projected DROP period of current DROP members in the data provided by the SRA.

<u>Load Applied to</u>	<u>Load Factor</u>	
	<u>State Police</u>	<u>LEOPS</u>
Active Normal Retirement Decrement	0.9892	0.9888
Liabilities for Members in the DROP	0.9888	0.9902
DROP Account Balances	0.9050	0.9169

Definitions of Technical Terms

Accrued Service

Service credited under the system which was rendered before the date of the actuarial valuation.

Actuarial Accrued Liability

The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as "past service liability."

Actuarial Assumptions

Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method

A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future benefits" between future normal costs and Actuarial Accrued Liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent

One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.

Actuarial Gain (Loss)

The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities -- during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.

Actuarial Present Value

The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payments.

Amortization

Paying off an interest-discounted amount with periodic payments of interest and (generally) principal -- as opposed to paying off with a lump sum payment.

Definitions of Technical Terms

Normal Cost

The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as "current service cost."

Projected Benefit Obligation

The portion of a member's projected benefit attributable to service before the valuation date - allocated based on the ratio of accrued service to projected total service and based on anticipated future compensation.

Unfunded Actuarial Accrued Liabilities

The difference between actuarial accrued liabilities and valuation assets. Sometimes referred to as "unfunded past service liability" or "unfunded supplemental present value."

Most retirement systems have unfunded actuarial accrued liabilities. They arise each time new benefits are added and each time an actuarial loss occurs.

The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).

APPENDIX B



MEMBERSHIP INFORMATION

State Retirement and Pension System Summary of Membership Data as of June 30, 2018 (State and Municipal)

		Active Members		Retirees and Beneficiaries					Vested Former Members (Includes Inactives)	Total Number
		Number	Salary	Number	Benefits#	Avg. Monthly Benefit	Avg. Age	Avg. Age at Ret.*		
Teachers' Retirement - STATE	Total	106	\$ 12,576,179							
	Vested	106	\$ 12,576,179							
	Non-vested	0	\$ -	3,470	\$ 132,185,072	\$ 3,174	80.2	62.1	70	3,646
Teachers' Pension - STATE	Total	8,951	\$ 538,105,714							
	Vested	5,048	\$ 340,972,987							
	Non-vested	3,903	\$ 197,132,727	5,937	\$ 103,213,756	\$ 1,449	72.9	63.4	3,107	17,995
Teachers' Retirement - LOCAL	Total	312	\$ 28,920,891							
	Vested	312	\$ 28,920,891							
	Non-vested	0	\$ -	22,294	\$ 881,800,560	\$ 3,296	77.5	58.3	129	22,735
Teachers' Pension - LOCAL	Total	97,477	\$ 6,361,493,817							
	Vested	62,151	\$ 4,595,630,570							
	Non-vested	35,326	\$ 1,765,863,247	45,500	\$ 1,072,406,073	\$ 1,964	70.5	61.9	21,882	164,859
Employees' Retirement	Total	7,725	\$ 397,640,605							
	Vested	5,720	\$ 307,397,058							
	Non-vested	2,005	\$ 90,243,547	20,340	\$ 489,897,052	\$ 2,007	73.5	57.0	756	28,821
Employees' Pension	Total	73,483	\$ 3,903,606,885							
	Vested	42,718	\$ 2,495,533,050							
	Non-vested	30,765	\$ 1,408,073,835	57,947	\$ 883,698,006	\$ 1,271	70.1	62.1	25,942	157,372
State Police	Total	1,347	\$ 100,324,842							
	Vested	921	\$ 77,052,585							
	Non-vested	426	\$ 23,272,257	2,477	\$ 123,862,208	\$ 4,167	64.0	47.8	99	3,923
Judges	Total	316	\$ 47,498,152							
	Vested	197	\$ 29,782,325							
	Non-vested	119	\$ 17,715,827	421	\$ 33,319,561	\$ 6,595	77.5	65.2	9	746
LEOPS	Total	2,617	\$ 170,555,081							
	Vested	1,602	\$ 116,890,717							
	Non-vested	1,015	\$ 53,664,364	1,954	\$ 69,878,318	\$ 2,980	60.6	52.7	305	4,876
CORS	Total	97	\$ 5,497,631							
	Vested	60	\$ 3,689,697							
	Non-vested	37	\$ 1,807,934	34	\$ 942,809	\$ 2,311	59.8	56.8	2	133
Total Systems	Total	192,431	\$ 11,566,219,797							
	Vested	118,835	\$ 8,008,446,059							
	Non-vested	73,596	\$ 3,557,773,738	160,374	\$ 3,791,203,416	\$ 1,970	71.8	60.7	52,301	405,106

* Includes normal and early service retirees only.

Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018.

State Retirement and Pension System Summary of Membership Data as of June 30, 2018 (State Only)

		Active Members		Retirees and Beneficiaries				Vested Former Members (Includes Inactives)		Total Number
		Number	Salary	Number	Benefits#	Avg. Monthly Benefit	Avg. Age	Avg. Age at Ret.*	Number	
Teachers'	Total	106	\$ 12,576,179							
Retirement - STATE	Vested	106	\$ 12,576,179							
	Non-vested	0	\$ -	3,470	\$ 132,185,072	\$ 3,174	80.2	62.1	70	3,646
Teachers'	Total	8,951	\$ 538,105,714							
Pension - STATE	Vested	5,048	\$ 340,972,987							
	Non-vested	3,903	\$ 197,132,727	5,937	\$ 103,213,756	\$ 1,449	72.9	63.4	3,107	17,995
Teachers'	Total	312	\$ 28,920,891							
Retirement - LOCAL	Vested	312	\$ 28,920,891							
	Non-vested	0	\$ -	22,294	\$ 881,800,560	\$ 3,296	77.5	58.3	129	22,735
Teachers'	Total	97,477	\$ 6,361,493,817							
Pension - LOCAL	Vested	62,151	\$ 4,595,630,570							
	Non-vested	35,326	\$ 1,765,863,247	45,500	\$ 1,072,406,073	\$ 1,964	70.5	61.9	21,882	164,859
Employees'	Total	7,668	\$ 394,062,749							
Retirement	Vested	5,663	\$ 303,819,202							
	Non-vested	2,005	\$ 90,243,547	17,517	\$ 429,078,579	\$ 2,041	72.6	56.5	738	25,923
Employees'	Total	48,995	\$ 2,771,524,765							
Pension	Vested	28,971	\$ 1,769,136,335							
	Non-vested	20,024	\$ 1,002,388,430	42,603	\$ 686,341,215	\$ 1,343	70.0	61.7	19,309	110,907
State Police	Total	1,347	\$ 100,324,842							
	Vested	921	\$ 77,052,585							
	Non-vested	426	\$ 23,272,257	2,477	\$ 123,862,208	\$ 4,167	64.0	47.8	99	3,923
Judges	Total	316	\$ 47,498,152							
	Vested	197	\$ 29,782,325							
	Non-vested	119	\$ 17,715,827	421	\$ 33,319,561	\$ 6,595	77.5	65.2	9	746
LEOPS	Total	1,590	\$ 107,729,522							
	Vested	961	\$ 73,111,102							
	Non-vested	629	\$ 34,618,420	1,520	\$ 53,492,348	\$ 2,933	61.8	52.8	190	3,300
Total Systems	Total	166,762	\$ 10,362,236,631							
	Vested	104,330	\$ 7,231,002,176							
	Non-vested	62,432	\$ 3,131,234,455	141,739	\$ 3,515,699,371	\$ 2,067	71.9	60.5	45,533	354,034

* Includes normal and early service retirees only.

Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018.

State Retirement and Pension System Summary of Membership Data as of June 30, 2018 (Municipal Only)

		Active Members		Retirees and Beneficiaries				Vested Former Members (Includes Inactives)	Total	
		Number	Salary	Number	Benefits#	Avg. Monthly Benefit	Avg. Age	Avg. Age at Ret.*	Number	Number
Employees' Retirement	Total	57	\$ 3,577,856							
	Vested	57	\$ 3,577,856							
	Non-vested	0	\$ -	2,823	\$ 60,818,473	\$ 1,795	79.1	59.8	18	2,898
Employees' Pension	Total	24,488	\$ 1,132,082,120							
	Vested	13,747	\$ 726,396,715							
	Non-vested	10,741	\$ 405,685,405	15,344	\$ 197,356,792	\$ 1,072	70.3	63.2	6,633	46,465
LEOPS	Total	1,027	\$ 62,825,559							
	Vested	641	\$ 43,779,615							
	Non-vested	386	\$ 19,045,944	434	\$ 16,385,970	\$ 3,146	56.4	52.4	115	1,576
CORS	Total	97	\$ 5,497,631							
	Vested	60	\$ 3,689,697							
	Non-vested	37	\$ 1,807,934	34	\$ 942,809	\$ 2,311	59.8	56.8	2	133
Total Systems	Total	25,669	\$ 1,203,983,166							
	Vested	14,505	\$ 777,443,883							
	Non-vested	11,164	\$ 426,539,283	18,635	\$ 275,504,045	\$ 1,232	71.3	62.5	6,768	51,072

* Includes normal and early service retirees only.

Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018.

Active Membership Information

Maryland State Retirement and Pension System Active Membership Statistics June 30, 2018				
System	Number	Average Age	Average Credited Service	Average Salary
Teachers' Retirement	418	67.3	42.1	\$ 99,275
Teachers' Pension	106,428	44.9	11.9	64,829
Employees' Retirement – State	300	65.6	42.0	76,800
Employees' Retirement – Municipal	57	63.6	41.5	62,769
Employees' Retirement – Legislators	189	56.4	10.2	50,489
Employees' Retirement – Correctional Officers	7,179	44.6	12.9	50,352
Employees' Retirement – Total	7,725	45.8	14.2	51,475
Employees' Pension – State	48,995	48.2	12.2	56,565
Employees' Pension – Municipal	24,488	49.3	10.7	46,230
Employees' Pension – Total	73,483	48.6	11.7	53,121
State Police	1,347	36.3	12.0	74,480
Judges	316	57.8	8.4	150,311
LEOPS – State	1,590	42.3	10.8	67,754
LEOPS – Municipal	1,027	39.1	10.9	61,174
LEOPS – Total	2,617	41.0	10.8	65,172
CORS	97	41.2	10.3	56,677
TOTAL SYSTEMS	192,431	46.3	11.9	60,105
	Teachers' Retirement		Employees' Retirement	
	Number	Earnings	Number	Earnings
Unlimited COLA	252	\$ 25,920,084	210	\$ 15,906,937
5% COLA Cap	102	9,847,077	112	8,392,203
Bifurcate	64	5,729,909	35	2,318,735
	<u>418</u>	<u>\$ 41,497,070</u>	<u>357</u>	<u>\$ 26,617,875</u>

Active Membership – Age & Service Distribution

June 30, 2018

Teachers' Combined System

Age Nearest Birthday	Nearest Whole Years of Service on the Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	22							22	\$ 356,983
20-24	2,246	7						2,253	93,555,036
25-29	8,018	2,441	11					10,470	500,625,146
30-34	4,275	5,558	2,379	12				12,224	681,257,761
35-39	3,081	2,517	6,323	1,848	9			13,778	885,455,170
40-44	2,656	1,860	3,015	4,518	1,190	1		13,240	934,690,736
45-49	2,728	2,070	2,611	2,867	3,697	839	9	14,821	1,076,284,704
50-54	2,095	1,834	2,525	2,125	2,024	2,257	591	13,451	948,259,077
55-59	1,382	1,387	2,401	2,234	1,709	1,244	1,561	11,918	808,257,029
60	192	225	400	419	340	241	373	2,190	150,146,122
61	163	201	386	399	352	257	358	2,116	143,160,609
62	151	171	366	385	327	219	381	2,000	139,342,133
63	124	144	247	309	276	179	301	1,580	108,017,472
64	92	112	219	254	254	142	263	1,336	93,255,275
65	75	118	216	202	208	152	278	1,249	86,564,577
66	63	79	143	172	145	135	264	1,001	73,432,458
67	47	76	126	112	123	86	195	765	53,785,020
68	38	66	84	92	78	50	152	560	40,835,331
69	27	54	84	58	53	55	113	444	29,957,229
70	21	34	52	60	53	30	87	337	23,022,605
71	28	29	55	39	30	31	89	301	19,573,287
72	17	19	37	27	25	21	57	203	12,951,989
73	11	14	26	23	14	13	32	133	8,697,446
74	6	9	19	22	9	11	38	114	7,486,015
75	10	7	17	11	12	8	28	93	6,477,245
76	7	1	11	15	5	4	27	70	4,371,740
77	1	5	10	7	7	4	18	52	3,377,896
78	3	2	7	5	3	5	9	34	1,899,716
79+	1	8	17	15	8	5	37	91	6,000,794
Totals	27,580	19,048	21,787	16,230	10,951	5,989	5,261	106,846	\$6,941,096,601

Active Membership – Age & Service Distribution

June 30, 2018

Employees' Combined System

Age Nearest Birthday	Nearest Whole Years of Service on the Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	30							30	\$ 780,162
20-24	1,199	17						1,216	40,707,922
25-29	4,252	819	37					5,108	208,092,928
30-34	3,969	2,378	1,067	33				7,447	344,898,962
35-39	3,341	2,053	2,053	564	10			8,021	404,741,802
40-44	2,505	1,803	1,959	1,541	419	13		8,240	438,699,389
45-49	2,532	1,783	1,991	1,880	1,345	489	74	10,094	554,830,376
50-54	2,406	1,971	2,225	1,938	1,515	1,259	914	12,228	675,591,880
55-59	2,134	1,792	2,170	1,903	1,490	1,335	2,063	12,887	728,668,114
60	354	332	366	375	296	269	502	2,494	142,443,039
61	313	333	378	330	273	231	461	2,319	132,303,560
62	315	291	321	297	243	194	450	2,111	121,249,885
63	190	225	265	262	180	133	373	1,628	94,896,340
64	182	212	229	231	143	112	328	1,437	83,843,488
65	147	149	208	177	111	101	303	1,196	69,974,756
66	120	148	180	123	103	75	215	964	56,330,309
67	91	106	157	103	76	59	179	771	44,885,585
68	63	103	116	85	55	47	144	613	35,659,788
69	59	75	113	84	40	36	95	502	27,150,287
70	57	56	83	66	34	24	107	427	23,453,871
71	44	34	61	56	41	25	71	332	18,101,169
72	40	37	45	40	23	20	43	248	12,680,839
73	22	24	36	23	18	17	49	189	9,696,841
74	21	32	27	33	12	12	28	165	7,599,489
75	26	15	21	19	11	10	18	120	5,709,567
76	37	12	21	19	7	6	20	122	5,154,926
77	8	14	13	13	7	4	17	76	3,499,960
78	16	10	17	13	2	2	13	73	2,764,500
79+	2	16	33	28	23	10	38	150	6,837,756
Totals	24,475	14,840	14,192	10,236	6,477	4,483	6,505	81,208	\$4,301,247,490

Active Membership – Age & Service Distribution

June 30, 2018

State Police

Age Nearest Birthday	Nearest Whole Years of Service on the Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	5							5	\$ 127,510
20-24	93	5						98	4,390,931
25-29	128	110	13					251	14,787,402
30-34	33	135	96	6				270	18,394,703
35-39	10	41	104	86	3			244	19,046,343
40-44	8	14	37	63	76	2		200	17,508,842
45-49	2	13	24	37	96	17	4	193	17,976,781
50-54	1	3	13	10	26	7	6	66	6,094,590
55-59			2	6	3	3	5	19	1,886,716
60							1	1	111,024
Totals	280	321	289	208	204	29	16	1,347	\$100,324,842

Active Membership – Age & Service Distribution

June 30, 2018

Judges

Age Nearest Birthday	Nearest Whole Years of Service on the Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
35-39	1							1	\$ 141,333
40-44	12	2						14	2,070,362
45-49	28	11						39	5,783,187
50-54	24	13	5	1				43	6,445,519
55-59	28	16	11	15				70	10,451,610
60	5	5	5	5				20	3,032,360
61	3	4	3	9				19	2,877,927
62	9	2	3	4				18	2,723,494
63	4	4	5	3				16	2,366,128
64	1	4	3	6				14	2,131,662
65	1	1	1	5				8	1,205,364
66	2	5	8	1				16	2,467,828
67	2	3	1	3				9	1,439,797
68		1	4	5				10	1,513,930
69		1	3	8				12	1,808,886
70		1	1	5				7	1,038,765
Totals	120	73	53	70	0	0	0	316	\$47,498,152

Active Membership – Age & Service Distribution

June 30, 2018

LEOPS

Age Nearest Birthday	Nearest Whole Years of Service on the Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24	97	11						108	\$ 4,690,833
25-29	235	120	1					356	18,169,477
30-34	137	180	93	2				412	23,715,014
35-39	52	67	136	87	4			346	22,069,862
40-44	43	52	97	100	36	2		330	22,474,962
45-49	46	48	65	103	159	19		440	32,133,961
50-54	47	56	42	53	74	37	14	323	24,464,969
55-59	26	32	38	19	28	10	12	165	12,320,864
60	2	5	3	3	2	4		19	1,419,628
61	3	2	8	5	2	2	3	25	2,045,376
62		5	5	5	1		3	19	1,535,877
63	1	6	9	1	3	1	1	22	1,550,860
64	1	1	7	2	1		1	13	979,249
65	4	2	2	1			1	10	628,556
66		1	1	2	1			5	328,599
67			4	2	2		2	10	923,968
68		2		2			1	5	471,670
69		1	1	1				3	214,010
70		1		2	1			4	236,788
71				1	1			2	180,558
Totals	694	592	512	391	315	75	38	2,617	\$170,555,081

Active Membership – Age & Service Distribution

June 30, 2018

CORS

Age Nearest Birthday	Nearest Whole Years of Service on the Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24	1							1	\$ 43,659
25-29	12	4						16	743,994
30-34	7	8	1					16	827,964
35-39		4	8					12	663,059
40-44	3	5	1	5	2			16	975,524
45-49		3	2	5	3			13	792,603
50-54		4	1		2			7	403,664
55-59		2	4	1	2		2	11	781,278
60	1	2		1				4	212,763
62		1						1	53,123
Totals	24	33	17	12	9	0	2	97	\$5,497,631

Retired Membership Statistics June 30, 2018 (State and Municipal)

System	Number	Average Age	Average Credited Service*	Average Final Average Salary*	Average Benefit
Teachers' Retirement	25,764	77.8	29.1	\$ 53,205	\$ 39,357
Teachers' Pension	51,437	70.7	22.0	58,951	22,856
Employees' Retirement – State	17,517	72.6	24.7	40,368	24,495
Employees' Retirement – Municipal	<u>2,823</u>	79.1	24.4	32,053	21,544
Employees' Retirement – Total	20,340	73.5	24.8	39,214	24,085
Employees' Pension – State	42,603	70.0	21.0	45,607	16,110
Employees' Pension – Municipal	<u>15,344</u>	70.3	18.1	39,166	12,862
Employees' Pension – Total	57,947	70.1	20.1	43,902	15,250
State Police	2,477	64.0	23.5	53,661	50,005
Judges	421	77.5	14.0	154,782	79,144
LEOPS – State	1,520	61.8	22.5	59,450	35,192
LEOPS – Municipal	<u>434</u>	56.4	22.3	65,033	37,756
LEOPS – Total	1,954	60.6	22.5	60,690	35,762
CORS – Municipal	34	59.8	20.8	66,867	27,730
Total - State	141,739	71.9	23.3	51,797	24,804
Total - Municipal	18,635	71.3	19.3	38,741	14,784
TOTAL SYSTEMS	160,374	71.8	22.8	50,280	23,640

* Only non-zero values included in averages.

Retired Membership Statistics –by Type

June 30, 2018

(State and Municipal)

System	Service Retirees		Disabilities		Beneficiaries	
	Number	Average Age	Number	Average Age	Number	Average Age
Teachers' Retirement	22,655	77.6	642	77.0	2,467	80.1
Teachers' Pension	45,946	71.3	3,918	64.0	1,573	72.0
Employees' Retirement – State	13,420	72.8	1,625	61.4	2,472	78.6
Employees' Retirement – Municipal	2,079	79.1	185	77.3	559	79.8
Employees' Retirement – Total	15,499	73.7	1,810	63.0	3,031	78.8
Employees' Pension – State	34,630	71.0	5,512	63.7	2,461	71.5
Employees' Pension – Municipal	11,838	72.0	2,688	62.9	818	71.0
Employees' Pension – Total	46,468	71.2	8,200	63.4	3,279	71.4
State Police	1,527	64.7	605	57.2	345	73.2
Judges	304	75.5	4	67.5	113	83.3
LEOPS – State	1,106	63.6	321	54.3	93	66.2
LEOPS – Municipal	308	59.2	109	49.3	17	51.8
LEOPS – Total	1,414	62.7	430	53.0	110	64.0
CORS – Municipal	25	62.0	7	51.9	2	61.3
Total - State	119,588	72.4	12,627	63.6	9,526	75.8
Total - Municipal	14,250	72.7	2,989	63.3	1,394	74.2
TOTAL SYSTEMS	133,838	72.4	15,616	63.5	10,920	75.6

Retired Membership – Attained Age June 30, 2018 (State and Municipal)

Age at Valuation Date	Teachers'		Employees		State Police		Judges		LEOPS		CORS (Municipal)		Total	
	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits#	Annual Benefits	
Under 30	9	\$ 81,923	38	\$ 315,274	4	\$ 130,023	-	-	7	\$ 170,651	-	-	58	\$ 697,871
30-34	16	425,345	62	1,353,157	13	546,522	-	-	11	361,398	-	-	102	2,686,422
35-39	57	1,845,248	136	2,742,357	17	670,194	-	-	31	1,165,167	-	-	241	6,422,967
40-44	120	3,770,200	291	6,532,626	61	2,718,242	-	-	52	1,887,357	-	-	524	14,908,424
45-49	231	7,047,632	899	20,792,609	208	10,805,963	-	-	144	5,585,321	2	\$ 25,004	1,484	44,256,528
50-54	522	17,147,153	2,160	50,125,337	375	19,766,993	-	-	318	12,197,068	6	118,153	3,381	99,354,705
55-59	1,853	55,419,942	4,838	111,155,972	304	16,038,043	2	\$ 137,905	353	13,254,432	12	434,921	7,362	196,441,214
60-64	7,822	232,505,181	11,089	227,838,729	323	17,358,985	23	1,909,525	375	13,694,047	7	168,342	19,639	493,474,808
65-69	19,158	566,726,758	17,998	323,407,500	318	16,462,161	50	4,669,344	340	11,582,011	4	88,632	37,868	922,936,406
70-74	19,504	553,552,463	16,232	274,474,807	362	17,423,897	102	8,650,270	195	6,270,261	2	31,152	36,397	860,402,850
75-79	12,478	338,857,963	10,837	164,269,332	251	10,995,443	91	7,172,882	79	2,361,680	1	76,606	23,737	523,733,907
80-84	7,635	203,454,568	7,085	100,321,357	144	6,231,498	68	5,442,466	42	1,166,480	-	-	14,974	316,616,370
85-89	4,878	133,090,613	4,146	57,021,995	66	2,877,163	47	3,008,453	6	157,531	-	-	9,143	196,155,755
90-94	2,231	58,201,223	1,908	26,391,330	23	1,217,788	31	1,962,244	1	24,914	-	-	4,194	87,797,498
95-99	607	15,327,250	489	5,819,381	6	456,454	6	313,327	-	-	-	-	1,108	21,916,412
100-104	74	2,009,572	76	1,010,365	2	162,840	1	53,144	-	-	-	-	153	3,235,921
105-110	6	142,426	3	22,931	-	-	-	-	-	-	-	-	9	165,357
	77,201	\$ 2,189,605,461	78,287	\$ 1,373,595,058	2,477	\$ 123,862,208	421	\$ 33,319,561	1,954	\$ 69,878,318	34	\$ 942,809	160,374	\$ 3,791,203,416

Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018.

Retired Membership* – By Calendar Year of Retirement

June 30, 2018

(State and Municipal)

Year of Retirement	Teachers ¹		Employees		State Police		Judges		LEOPS		CORS (Municipal)		Total	
	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits#	Number	Annual Benefits
Before 1988	3,583	\$ 97,533,756	3,089	\$ 48,485,864	381	\$ 15,396,862	39	\$ 1,838,556	-	-	-	-	7,092	\$ 163,255,038
1988	584	16,881,343	585	9,678,196	40	1,495,359	6	343,328	-	-	-	-	1,215	28,398,226
1989	737	20,812,668	652	10,829,369	54	2,312,693	4	178,928	-	-	-	-	1,447	34,133,658
1990	751	21,743,686	714	11,402,535	44	1,875,999	11	675,079	9	221,811	-	-	1,529	35,919,111
1991	995	31,481,912	906	15,341,312	43	2,060,080	2	87,050	16	\$ 406,685	-	-	1,962	49,377,038
1992	1,452	47,812,976	1,083	17,371,712	94	4,496,596	6	288,085	19	576,938	-	-	2,654	70,546,306
1993	1,193	35,271,796	1,036	15,600,305	61	2,848,376	5	209,737	12	365,992	-	-	2,307	54,296,206
1994	1,297	35,527,248	1,138	16,971,279	69	3,204,807	6	443,147	11	328,262	-	-	2,521	56,474,744
1995	1,477	39,892,858	1,360	20,510,942	58	2,685,799	12	848,263	13	400,457	-	-	2,920	64,338,319
1996	1,677	46,716,972	2,378	42,047,790	74	3,441,471	14	999,142	13	393,286	-	-	4,156	93,598,661
1997	1,750	48,970,530	1,631	27,085,645	56	2,616,270	6	442,176	15	346,090	-	-	3,458	79,460,711
1998	1,953	56,914,451	1,521	21,522,364	56	2,658,413	10	640,307	23	522,509	-	-	3,563	82,258,045
1999	2,442	71,818,895	1,641	24,621,114	59	3,250,099	10	896,717	33	736,486	-	-	4,185	101,323,311
2000	2,415	69,649,495	1,800	25,875,946	133	7,278,555	10	912,894	72	2,146,710	-	-	4,430	105,863,600
2001	2,383	68,267,193	1,899	29,000,126	89	5,122,841	13	902,880	97	3,512,192	-	-	4,481	106,805,231
2002	2,527	70,610,062	2,156	33,199,611	84	5,040,706	15	1,128,617	86	3,163,196	-	-	4,868	113,142,193
2003	2,574	73,264,760	2,567	42,944,202	100	6,145,098	10	809,308	88	3,616,642	-	-	5,339	126,780,010
2004	2,936	84,470,409	2,933	50,794,626	95	5,365,518	13	1,110,158	80	2,998,475	-	-	6,057	144,739,184
2005	2,979	80,996,442	3,138	54,510,049	105	5,817,251	14	1,237,002	93	3,523,913	-	-	6,329	146,084,656
2006	2,647	72,482,288	2,850	48,705,984	82	4,347,911	16	1,367,777	84	3,103,038	-	-	5,679	130,006,998
2007	2,949	84,382,048	3,183	57,174,480	91	4,589,720	22	1,962,497	87	3,023,312	-	-	6,332	151,132,057
2008	3,038	84,244,851	3,342	58,737,822	79	3,937,548	13	1,182,867	98	3,590,304	-	-	6,570	151,693,392
2009	2,933	75,453,673	3,422	58,110,373	67	3,541,557	16	1,357,180	118	4,465,273	1	14,252	6,557	142,942,309
2010	3,446	99,906,835	4,019	74,828,342	74	4,432,297	16	1,400,498	97	3,741,753	6	\$ 196,858	7,658	184,506,584
2011	4,228	127,369,366	4,310	81,841,359	79	3,897,092	16	1,431,036	120	4,455,791	3	186,440	8,756	219,181,085
2012	3,583	99,934,710	3,608	62,080,452	51	2,647,817	13	1,296,966	118	4,358,059	3	101,780	7,376	170,419,783
2013	3,704	103,537,603	4,037	71,461,253	59	3,039,541	21	1,765,289	116	4,240,693	6	175,122	7,943	184,219,500
2014	3,714	104,228,647	3,496	60,816,264	42	2,149,807	16	1,568,549	82	2,821,564	6	95,180	7,356	171,680,011
2015	3,821	106,809,396	4,557	90,141,437	49	2,539,347	17	1,579,505	112	3,932,081	3	35,746	8,559	205,037,512
2016	3,449	98,165,630	3,717	72,419,916	42	2,043,561	16	1,459,984	98	3,643,285	3	42,968	7,325	177,775,344
2017	3,305	97,542,359	3,835	81,770,914	52	2,701,038	22	1,912,130	86	2,880,347	3	94,463	7,303	186,901,251
2018	679	16,910,602	1,684	37,713,475	15	882,179	11	1,043,910	58	2,363,174	-	-	2,447	58,913,341
77,201	\$ 2,189,605,461	78,287	\$ 1,373,595,058	2,477	\$ 123,862,208	421	\$ 33,319,561	1,954	\$ 69,878,318	34	\$ 942,809	160,374	\$ 3,791,203,416	

[#] Retiree benefit amounts include the cost-of-living-adjustment granted July 1, 2018.

APPENDIX C

SUMMARY OF PLAN PROVISIONS

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Teachers' Retirement System of the State of Maryland

1. Membership

System closed to new members hired on or after January 1, 1980. Members on December 31, 1979 continue to be members unless they elected to transfer into the Teachers' Pension System (established January 1, 1980) prior to January 1, 2005.

Membership includes any teacher, helping teacher, principal, supervisor, superintendent, or clerk employed in public day school within the State of Maryland, or controlled by the State; any librarian or clerical employee of a library established or operated under the Education Article; any professional or clerical employee of a community college established or operated under the Education Article; or staff employee of the University System of Maryland, Morgan University or St. Mary's College who is a member as of January 1, 1998.

2. Member Contributions

Retirement System members participate under one of three elections (effective July 1, 1984):

- Plan A: Generally 7% of earnable compensation to maintain all benefits, including unlimited compounded cost-of-living adjustments.
- Plan B: Generally 5% of earnable compensation to maintain all benefits, except the compounded cost-of-living adjustments which are capped at 5%.
- Plan C: 5% of earnable compensation as determined under the employee contribution for the Teachers' Pension System (Plan C provides a two-part benefit based on benefits of the Teachers' Retirement System and the Teachers' Pension System).

Interest earned on all employee contributions is 4% per year.

3. Service Retirement Allowance

Eligibility: 30 years of eligibility service or attainment of age 60.

Allowance: $1/55^{\text{th}}$ of average final compensation for the three highest years as a member for each year of creditable service. Creditable service is based on a full normal working time for teachers – ten months equals one year.

Plan C: For creditable service before election date, the amount determined by the service retirement formula for Teachers' Retirement System; for creditable service after election date, the amount determined by the service retirement formula for the Teachers' Non-Contributory Pension System.

Teachers' Retirement System of the State of Maryland

4. Early Retirement Allowance

Eligibility: 25 years of eligibility service.

Allowance: Service Retirement allowance reduced by .005 for each month that date of retirement precedes the earlier of age 60 or the date the member would have completed 30 years of eligibility service. The maximum reduction is 30%.

Plan C: For creditable service before election date, the amount determined by the service retirement formula for Teachers' Retirement System with a maximum reduction of 30%; for creditable service after election date, the amount determined by the service retirement formula for the Teachers' Pension System with a .005 reduction for each month retirement occurs prior to age 62 (maximum reduction of 42%).

5. Disability Retirement Allowance

Ordinary

Eligibility: Five years of eligibility service and certification of the medical board designated by the Board of Trustees that member is mentally or physically incapacitated from the performance of the normal duties of the member's position, and that incapacity is permanent.

Allowance: The benefit is $1/55^{\text{th}}$ of average final compensation for the three highest years as a member for each year of creditable service. The minimum benefit is 25% of average final compensation; the maximum benefit can be no greater than $1/55^{\text{th}}$ of average final compensation for each year of creditable service the member would have accrued if employment continued to age 60.

Plan C: The benefit is the greater of the Teachers' Retirement System allowance noted above, or the ordinary disability benefit of the Teachers' Pension System.

Accidental

Eligibility: Certification of the medical board designated by the Board of Trustees that member is totally and permanently incapacitated from the performance of the normal duties of the member's position as the natural and proximate result of an accident that occurred in the actual performance of duty.

Allowance: The benefit is 66 2/3% of average final compensation for the three highest years as a member, plus the annuity provided by accumulated member contributions. The maximum benefit cannot be greater than the average final compensation.

Teachers' Retirement System of the State of Maryland

6. Death Benefits

Eligibility: One year of eligibility service.

Benefit: One time lump sum payment of member's annual earnable compensation at time of death plus accumulated contributions. If member dies prior to accruing one year of service, payment is only the return of accumulated member contributions.

Spouse Law

Eligibility: Surviving spouse designated as the sole primary beneficiary and the deceased member was eligible to retire or was age 55 with at least 15 years of eligibility service.

Benefit: Surviving spouse may elect a one-time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions, or a monthly allowance under Option 2 (100% survivor benefit).

Special Death Benefit

Eligibility: Killed in line of duty.

Benefit: 66 2/3% of average final compensation for the three highest years as a member payable to a surviving spouse, dependent children or dependent parents. Accumulated member contributions are paid to the designated beneficiary (ies). Beginning July 1, 2017, the duration of payments that may be made to dependent children receiving a special death benefit is extended to surviving nondisabled children until each child turns 26 years old. Disabled children receiving a special death benefit may receive a special death benefit as long as they remain disabled.

Note: Death benefits outlined above are payable upon death of an active member. If member is not active, only accumulated member contributions are payable at time of death.

7. Vested Retirement Allowance

Eligibility: Five years of eligibility service.

Allowance: Accrued retirement allowance payable at age 60, provided member does not withdraw accumulated contributions.

8. Cost-of-Living Adjustments (COLA)

Retirement allowances may be adjusted based on the Consumer Price Index. The adjustments are effective July 1 for all benefits which have been in payment for one year.

- Plan A: Unlimited and compounded.
- Plan B: Capped at 5% and compounded.
- Plan C: Combination of COLA for Plan A or Plan B - depending on member election prior to electing Plan C - for benefit calculated under the Teachers' Retirement System, plus capped 3% compounded COLA on benefit calculated under the Teachers' Pension System.

Teachers' Retirement System of the State of Maryland

In years in which COLAs would be less than zero due to a decline in the Consumer Price Index, retirement allowances will not be adjusted. COLAs in succeeding years are adjusted until the difference between the negative COLA that would have applied and the zero COLA is fully recovered.

9. Optional Forms of Payment

Normal service allowance is a single life annuity.

- Option 1: Cash refund equal to excess of present value of retirement allowance at date of retirement minus total amount of payments made to date of death.
- Option 2: 100% joint and survivor annuity. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 3: 50% joint and survivor annuity.
- Option 4: This option guarantees a return of accumulated member contributions remaining at date of death.
- Option 5: 100% "pop-up" joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 6: 50% "pop-up" joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree.

For Option 5 and 6 – If the designated beneficiary predeceases the retiree, a new beneficiary may be named. However, the retirement allowance will be re-calculated.

Retirees who are to receive a service retirement, early service retirement, disability benefit, or vested allowance of less than \$50 a month may elect to receive a lump-sum payment equal to the present value in lieu of a monthly benefit.

10. Reduction for Benefits Payable under Workers' Compensation

Disability retirement allowances, excluding annuity reserves, are reduced for workers' compensation benefits payable after retirement from injury occurring during employment by the State if the workers' compensation benefits are for the same injury for which disability retirement was granted and are paid for the same period of time for which the retirement benefits are paid.

Teachers' Pension System of the State of Maryland

1. Membership

Membership is a condition of employment for all teachers hired on or after January 1, 1980. Certain eligible higher education employees may elect to join an optional defined contribution program provided by the State. Included in the definition of teacher is any teacher, helping teacher, principal, supervisor, superintendent, or clerk employed in public day school within the State of Maryland, or controlled by the State; any faculty employee of an educational institution supported or controlled by the State; any librarian or clerical employee of a library established or operated under the Education Article; any professional or clerical employee of a community college established or operated under the Education Article.

All individuals who are members of the Teacher's Pension System on or before June 30, 2011, participate in the Alternate Contributory Pension Selection (ACPS) except for the few members who transferred from the Teachers' Retirement System after April 1, 1998 or former vested members who terminated employment prior to July 1, 1998.

All individuals who enroll in the Teachers' Pension System on or after July 1, 2011, participate in the Reformed Contributory Pension Benefit (RCPB).

2. Member Contributions

Members of both the ACPS and the RCPB are required to make contributions of 7% of earnable compensation.

Contributions earn interest at 5% per year.

3. Service Retirement Allowance

ACPS Eligibility - 30 years of eligibility service or attainment of one of the following:

- Age 62 with 5 years of eligibility service.
- Age 63 with 4 years of eligibility service.
- Age 64 with 3 years of eligibility service.
- Age 65 and older with 2 years of eligibility service.

RCPB Eligibility: Combined age and eligibility service of at least 90 years or age 65 after 10 years of eligibility service.

RCPB Allowance: 1.5% of average final compensation for the five highest consecutive years as an employee for each year of creditable service on or after July 1, 2011.

Teachers' Pension System of the State of Maryland

ACPS Allowance - The greater of (i) or (ii), plus (iii), as described below:

- (i) 1.2% of average final compensation for the three highest consecutive years as an employee for each year of creditable service on or before June 30, 1998;
- (ii) 0.8% of average final compensation for the three highest consecutive years as an employee up to the Social Security integration level plus 1.5% of average final compensation over the integration level for each year of creditable service on or before June 30, 1998;
- (iii) 1.8% of average final compensation for the three highest consecutive years as an employee for each year of creditable service after June 30, 1998.

The Social Security integration level (SSIL) is the average of all Social Security Wage Bases over the thirty-five (35) calendar years prior to your retirement. Eligibility service is given based on a full normal working time in one year equal to ten months.

Note: Members who transferred into the Teachers' Pension System, on or after April 1, 1998, receive benefits based on the provisions of the NCPS (refer to page C-18) as in effect of January 1, 1980 except for COLA benefits. The COLAs are capped at a maximum of 3% compounded annually.

4. Early Retirement Allowance

ACPS Eligibility: Attainment of age 55 with at least 15 years of eligibility service.

ACPS Allowance: Service retirement allowance computed as of early retirement date, reduced by .005 for each month that early retirement date precedes age 62 (maximum reduction is 42%).

RCPB Eligibility: Attainment of age 60 with at least 15 years of eligibility service.

RCPB Allowance: Service retirement allowance computed as of early retirement date, reduced by .005 for each month that early retirement date precedes age 65 (maximum reduction is 30%).

5. Disability Retirement Allowance

Ordinary

Eligibility: Five years of eligibility service and certification of the medical board designated by the Board of Trustees that member is mentally or physically incapacitated from the performance of the normal duties of the member's position, and that incapacity is permanent.

Allowance: The benefit is the service retirement allowance computed on the basis that service continues until age 62 (age 65 for RCPB) without any change in rate of earnable compensation. If disability occurs after age 62 (age 65 for RCPB), the benefit is based on creditable service at time of retirement.

Teachers' Pension System of the State of Maryland

Accidental

Eligibility: Certification of the medical board designated by the Board of Trustees that member is totally and permanently incapacitated from the performance of the normal duties of the member's position as the natural and proximate result of an accident that occurred in the actual performance of duty.

Allowance: The benefit is 66 2/3% of average final compensation for the three highest consecutive years (five highest for RCPB) as a member plus the annuity provided by accumulated member contributions. The maximum benefit cannot be greater than the average final compensation.

6. Death Benefits

Eligibility: One year of eligibility service.

Benefit: One time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions. If member dies prior to accruing one year of service, payment is only the return of accumulated member contributions.

Spouse Law

Eligibility: Surviving spouse designated as the sole primary beneficiary and the deceased member was eligible to retire or had at least 25 years of eligibility service, or was at least 55 years old with at least 15 years of eligibility service.

Benefit: Surviving spouse may elect one time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions or a monthly allowance under Option 2 (100% survivor benefit).

Special Death Benefit

Eligibility: Killed in line of duty.

Benefit: 66 2/3% of average final compensation for the three highest consecutive years as a member payable to a surviving spouse, dependent children or dependent parents. Accumulated contributions are paid to the designated beneficiary(ies). Beginning July 1, 2017, the duration of payments that may be made to dependent children receiving a special death benefit is extended to surviving nondisabled children until each child turns 26 years old. Disabled children receiving a special death benefit may receive a special death benefit as long as they remain disabled.

Note: Death benefits outlined above are payable upon death of an active member. If member is not active, only accumulated member contributions are payable at time of death.

Teachers' Pension System of the State of Maryland

7. Vested Retirement Allowance

ACPS Eligibility: Five years of eligibility service.

ACPS Allowance: Accrued retirement allowance payable at age 62 provided member does not withdraw accumulated contributions. A member who has completed 15 years of eligibility service may begin to receive benefit payments at any time on or after attainment of age 55, reduced by .005 for each month that benefit commencement date precedes age 62.

If member does not commence to receive benefit payments, and dies before attaining age 62, only accumulated member contributions are returned.

RCPB Eligibility: Ten years of eligibility service.

RCPB Allowance: Accrued retirement allowance payable at age 65 provided member does not withdraw accumulated contributions. A member who has completed 15 years of eligibility service may begin to receive benefit payments at any time on or after attainment of age 60, reduced by .005 for each month that benefit commencement date precedes age 65.

If member does not commence to receive benefit payments, and dies before attaining age 65, only accumulated member contributions are returned.

8. Cost-of-Living Adjustments (COLA)

Retirement allowances may be adjusted each year based on the Consumer Price Index (CPI). Effective July 1, 1998, the adjustment is capped at a maximum of 3% compounded and is applied to all benefits which have been in payment for one year.

For benefits attributable to service on or after July 1, 2011, the Cost-of-living adjustment is capped at the lesser of 2.5% or the increase in CPI if the most recent calendar year market value rate of return was greater than or equal to the assumed rate of investment return from the most recent actuarial valuation. The adjustment is capped at the lesser of 1% or the increase in CPI if the most recent calendar year market value rate of return was less than the assumed rate of investment return from the most recent actuarial valuation.

In years in which COLAs would be less than zero due to a decline in the CPI, retirement allowances will not be adjusted. COLAs in succeeding years are adjusted until the difference between the negative COLA that would have applied and the zero COLA is fully recovered.

Any adjustments are effective July 1.

Teachers' Pension System of the State of Maryland

9. Optional Forms of Payment

Normal service allowance is a single life annuity.

- Option 1: Cash refund equal to excess of present value of retirement allowance at date of retirement minus total amount of payments made to date of death.
- Option 2: 100% joint and survivor annuity. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 3: 50% joint and survivor annuity.
- Option 4: This option guarantees a return of accumulated member contributions remaining at date of death.
- Option 5: 100% "pop-up" joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 6: 50% "pop-up" joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree.

For Option 5 and 6 – If the designated beneficiary predeceases the retiree, a new beneficiary may be named. However, the retirement allowance will be re-calculated.

Retirees who are to receive a service retirement, early service retirement, disability benefit, or vested allowance of less than \$50 a month may elect to receive a lump-sum payment equal to the present value in lieu of a monthly benefit.

10. Reduction for Benefits Payable under Workers' Compensation

Disability retirement allowances, excluding annuity reserves and COLA, are reduced for workers' compensation benefits payable after retirement from injury occurring during employment by the State, if the workers' compensation benefits are for the same injury for which disability retirement was granted and are paid for the same period of time for which the retirement benefits are paid.

Employees' Retirement System of the State of Maryland

1. Membership

System closed to new members hired on or after January 1, 1980. Members on December 31, 1979 continue to be members unless they elected to transfer into the Employees' Pension System (established January 1, 1980) prior to January 1, 2005.

Membership includes employees of the State and approximately 121 participating employers.

2. Member Contributions

- Plan A: Generally 7% of earnable compensation to maintain all benefits, including unlimited compounded cost-of-living adjustments.
- Plan B: Generally 5% of earnable compensation to maintain all benefits, except the compounded cost-of-living adjustments which are capped at 5%.
- Plan C: (Plan C provides a two-part benefit based on benefits of the Employees' Retirement System and the Employees' Non-Contributory Pension System). Employee contributions, if any, are based on participation of the employer in one of the three plans under the Employees' Pension System (refer to summary of Employees' Pension System).

Interest earned on all employee contributions is 4% per year.

3. Service Retirement Allowance

Eligibility: 30 years of eligibility service or attainment of age 60.

Allowance: 1/55th of average final compensation for the three highest years as a member for each year of creditable service.

Plan C: For creditable service before election date, the amount determined by the service retirement formula for Employees' Retirement System; for creditable service after election date, the amount determined by the service retirement formula for the Employees' Non-Contributory Pension System under which the employer participates.

Employees' Retirement System of the State of Maryland

4. Early Retirement Allowance

Eligibility: 25 years of eligibility service.

Allowance: Service retirement allowance reduced by .005 for each month that date of retirement precedes the earlier of age 60 or the date the member would have completed 30 years of eligibility service. The maximum reduction is 30%.

Plan C: For creditable service before election date, the amount determined by the service retirement formula for Employees' Retirement System with a maximum reduction of 30%; for creditable service after election date, the amount determined by the service retirement formula for the Employees' Non-Contributory Pension System under which the employer participates with a .005 reduction for each month retirement occurs prior to age 62 (maximum reduction of 42%).

5. Disability Retirement Allowance

Ordinary

Eligibility: Five years of eligibility service and certification of the medical board designated by the Board of Trustees that member is mentally or physically incapacitated from the performance of the normal duties of the member's position, and that incapacity is permanent.

Allowance: The benefit is $1/55^{\text{th}}$ of average final compensation for the three highest years as a member for each year of creditable service. The minimum benefit is 25% of average final compensation; the maximum benefit can be no greater than $1/55^{\text{th}}$ of average final compensation for each year of creditable service the member would have accrued if employment continued to age 60.

Plan C: The benefit is the greater of the Employees' Retirement System allowance noted above, or the ordinary disability benefit of the Employees' Pension System.

Accidental

Eligibility: Certification of the medical board designated by the Board of Trustees that member is totally and permanently incapacitated from the performance of the normal duties of the member's position as the natural and proximate result of an accident that occurred in the actual performance of duty.

Allowance: The benefit is 66 2/3% of average final compensation for the three highest years as a member, plus the annuity provided by accumulated member contributions. The maximum benefit cannot be greater than the average final compensation.

Employees' Retirement System of the State of Maryland

6. Death Benefits

Eligibility: One year of eligibility service.

Benefit: One time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions. If member dies prior to accruing one year of service, payment is only the return of accumulated member contributions.

Spouse Law

Eligibility: Surviving spouse designated as the sole primary beneficiary and the deceased member was eligible to retire or was at least age 55 with at least 15 years of eligibility service.

Benefit: Surviving spouse may elect a one-time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions, or a monthly allowance under Option 2 (100% survivor benefit).

Special Death Benefit

Eligibility: Killed in line of duty.

Benefit: 66 2/3% of average final compensation for the three highest years as a member payable to a surviving spouse, dependent children or dependent parents. Accumulated member contributions are paid to the designated beneficiary(ies). Beginning July 1, 2017, the duration of payments that may be made to dependent children of deceased ERS and CORS members receiving a special death benefit is extended to surviving nondisabled children until each child turns 26 years old. Disabled children receiving a special death benefit may receive a special death benefit as long as they remain disabled.

Note: Death benefits outlined above are payable upon death of an active member. If member is not active, only accumulated member contributions are payable at time of death.

7. Vested Retirement Allowance

Eligibility: Five years of eligibility service.

Allowance: Accrued retirement allowance payable at age 60, provided member does not withdraw accumulated member contributions.

Employees' Retirement System of the State of Maryland

8. Cost-of-Living Adjustments (COLA)

Retirement allowances may be adjusted based on the Consumer Price Index (CPI). Any adjustments are effective July 1 for all benefits which have been in payment for one year.

- Plan A: Unlimited and compounded.
- Plan B: Capped at 5% and compounded.
- Plan C: Combination of COLA for either Plan A or Plan B - (depending on member selection prior to electing Plan C) - for benefit calculated under the Employees' Retirement System, plus capped at 3% compounded COLA on benefit calculated under the Employees' Non-Contributory Pension System.

In years in which COLAs would be less than zero due to a decline in the Consumer Price Index, retirement allowances will not be adjusted. COLAs in succeeding years are adjusted until the difference between the negative COLA that would have applied and the zero COLA is fully recovered.

9. Optional Forms of Payment

Normal service allowance is a single life annuity.

Option 1: Cash refund equal to excess of present value of retirement allowance at date of retirement minus total amount of payments made to date of death.

Option 2: 100% joint and survivor annuity. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.

Option 3: 50% joint and survivor annuity.

Option 4: This option guarantees a return of accumulated member contributions remaining at date of death.

Option 5: 100% "pop-up" joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.

Option 6: 50% "pop-up" joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree.

Retirees who are to receive a service retirement, early service retirement, disability benefit, or vested allowance of less than \$50 a month may elect to receive a lump-sum payment equal to the present value in lieu of a monthly benefit.

For Option 5 and 6 – If the designated beneficiary predeceases the retiree, a new beneficiary may be named. However, the retirement allowance will be re-calculated.

Employees' Retirement System of the State of Maryland

10. Reduction for Benefits Payable Under Workers' Compensation

Disability retirement allowances, excluding annuity reserves and COLA, are reduced for workers' compensation benefits payable after retirement from injury occurring during employment by the State, if the workers' compensation benefits are for the same injury for which disability retirement was granted and are paid for the same period of time for which the retirement benefits are paid.

11. Miscellaneous Provisions

For Members of the General Assembly

For individuals who are members of the Legislative Pension Plan before January 1, 2015, the retirement allowance is equal to 3.00% of current legislative salary for each year of creditable service (maximum 22 years, 3 months) upon attainment of age 60 and at least eight years of creditable service. Reduced benefits are payable upon attainment of age 50 and completion of 8 years of creditable service. The benefit is reduced by .005 for each month between ages 50 and 60 that the early retirement date precedes age 60. For individuals who join the Legislative Pension Plan on or after January 1, 2015, the retirement allowance is equal to 3.00% of current legislative salary for each year of creditable service (maximum 22 years, 3 months) upon attainment of age 62 and at least eight years of creditable service. Reduced benefits are payable upon attainment of age 55 and completion of 8 years of creditable service. The benefit is reduced by .005 for each month between ages 55 and 62 that the early retirement date precedes age 62.

An individual who is a member of the Legislative Pension Plan before January 1, 2015, with eight years of creditable service who has not attained age 60 may leave contributions in the system and receive a retirement allowance at age 60, or a reduced benefit on or after age 50.

An individual who joins the Legislative Pension Plan on or after January 1, 2015, accrues eight years of creditable service, and who has not attained age 62 may leave contributions in the system and receive a retirement allowance at age 62, or a reduced benefit on or after age 55.

If an individual who is a member of the Legislative Pension Plan on or before December 31, 2018, terminates membership in the plan before the accruing eight years of creditable service, the member may make contributions equal to the member's and the State's required contributions that are necessary to purchase the number of years needed to reach eight years of service credit in the plan. An individual who purchases service credit to reach eight years of service credit in the Legislative Pension Plan may not begin receiving a retirement allowance from the plan until the number of years the member purchased has elapsed. Individuals who join the Legislative Pension Plan on or after January 1, 2019, may not purchase service credit to reach eight years of service credit in the plan.

A member who is certified as disabled by the Medical Board and approved by the Board of Trustees for a disability retirement benefit after attaining at least 8 years of creditable service may resign from the General Assembly and immediately receive a retirement allowance based on their creditable service.

Employees' Retirement System of the State of Maryland

The member's surviving spouse receives 50% of the member's retirement allowance if the member i) is retired, ii) is eligible for a deferred vested benefit, or iii) is active and has eight years of creditable service. The surviving spouse of a member who had accrued less than eight years of creditable service and dies in office shall receive a lump sum death benefit of accumulated contributions plus an amount equal to the deceased's annual earnable compensation at the time of death.

Members contribute 5% (7% beginning January 1, 2015) of their earnable compensation during their first 22 years, 3 months of service with contributions earning interest at 4% per year.

All retirement allowances are recalculated each time the salaries for current members of the General Assembly are increased.

Members who have attained eight years of membership service credit earned through service as a legislator in the Legislative Pension Plan may receive up to three years of service credit in the plan for military service.

For Correctional Officers

Correctional officers serving in the first six job classifications, individuals serving as a security chief, a facility administrator, and assistant warden or a warden, maximum security attendants at Clifton T. Perkins Hospital Center, a Correctional Dietary, Maintenance or Supply Officer, Maryland Correctional Enterprise Officers and Trainees, Plant Supervisors, Plant Managers, Regional Managers and Laundry Officers, Correctional Case Management Specialists, parole and probation agents, supervisors, and regional administrators and individuals employed by the Department of Public Safety and Correctional Services as alcohol and drug counselors, mental health counselors, psychologists, social workers, or recreation officers participate under this System. Effective July 1, 2006, Maryland counties may elect to participate on behalf of their detention center officers. Additionally, beginning July 1, 2018, individuals serving as a community detention officer or community detention supervisor, youth transportation officer, youth transportation officer lead, youth transportation, officer supervisor, youth transportation officer trainee, resident advisor, resident advisor lead, resident advisor supervisor, resident advisor trainee, or youth recreation specialist within the Department of Juvenile Services will participate in the Correctional Officers' Retirement System.

The retirement allowance for an individual who is a correctional officer on or before June 30, 2011, is 1/55th of average final compensation for the three highest years as a member for each year of creditable service. The retirement allowance for an individual who is a correctional officer on or after July 1, 2011, is 1/55th of average final compensation for the five highest years as a member for each year of creditable service.

An immediate service retirement allowance is payable to a correctional officer if, on or before the retirement, the officer has completed 20 years of eligibility service. For individuals who are members of this System on June 30, 2011, the vested retirement allowance of a member who has accrued at least 5 years of eligibility service commences at age 55. For individuals who become members on or after July 1, 2011, the vested retirement allowance for a member who has accrued at least 10 years of eligibility service commences at age 55.

Employees' Retirement System of the State of Maryland

For benefits attributable to service on or after July 1, 2011, the cost-of-living adjustment for Correctional Officers is capped at the lesser of 2.5% or the increase in CPI if the most recent calendar year market value rate of return was greater than or equal to the assumed rate of investment return from the most recent actuarial valuation. The adjustment is capped at the lesser of 1% or the increase in CPI if the most recent calendar year market value rate of return was less than the assumed rate of investment return from the most recent actuarial valuation.

Employees' Pension System of the State of Maryland

1. Membership

Membership is a condition of employment for all regular employees of the State of Maryland hired on or after January 1, 1980, excluding those eligible for the Teachers' Retirement System, Teachers' Pension System, State Police Retirement System, certain judges, correctional officers, and members of the General Assembly. Certain governmental units also have elected to participate in the System.

There are four plans under the Employees' Pension System.

- Noncontributory Pension System (**NCPS**) - The original pension system established on January 1, 1980 that only applies to certain participating governmental units that did not elect to participate in the Contributory Pension System or the Alternate Contributory Pension Selection.
- Employees' Contributory Pension System (**ECPS**) – The ECPS established July 1, 1998 that only applies to certain participating governmental units that elected the ECPS but did not elect to participate in the Alternate Contributory Pension Selection.
- Alternate Contributory Pension Selection (**ACPS**) - Applies to all State employees and employees of participating governmental units that are members of the ACPS on or before June 30, 2011.
- Reformed Contributory Pension Benefit (**RCPB**) – Applies to all State employees and, employees of participating governmental units enrolling in the Employees' Pension System on or after July 1, 2011. It does not apply to employees of participating governmental units covered by the NCPS or ECPS.

2. Member Contributions

NCPS: Members are only required to make contributions of 5% on earnable compensation that exceeds the Social Security Taxable Wage Base.

ECPS: Members are required to make contributions of 2% of earnable compensation.

ACPS: Members are required to make contributions of 7% of earnable compensation.

RCPB: Members are required to make contributions of 7% of earnable compensation.

Contributions earn interest at 5% per year.

Employees' Pension System of the State of Maryland

3. Service Retirement Allowance

NCPS, ECPS, and ACPS Eligibility - 30 years of eligibility service or attainment of one of the following:

- Age 62 with 5 years of eligibility service
- Age 63 with 4 years of eligibility service
- Age 64 with 3 years of eligibility service
- Age 65 or older with 2 years of eligibility service

NCPS Allowance:

0.8% of average final compensation up to the SSIL for the three highest consecutive years as a member plus 1.5% of average final compensation over the SSIL for each year of creditable service;

ECPS Allowance: The greater of (i) or (ii), plus (iii), as described below:

- (i) 1.2% of average final compensation for the three highest consecutive years as an employee for each year of creditable service on or before June 30, 1998;
- (ii) 0.8% of average final compensation up to the SSIL for the three highest consecutive years as a member plus 1.5% of average final compensation over the SSIL for each year of creditable service on or before June 30, 1998;
- (iii) 1.4% of average final compensation for the three highest consecutive years as an employee for each year of creditable service after June 30, 1998.

ACPS Allowance: The greater of (i) or (ii), plus (iii), as described below:

- (i) 1.2% of average final compensation for the three highest consecutive years as an employee for each year of creditable service on or before June 30, 1998;
- (ii) 0.8% of average final compensation up to the SSIL for the three highest consecutive years as a member plus 1.5% of average final compensation over the SSIL for each year of creditable service on or before June 30, 1998;
- (iii) 1.8% of average final compensation for the three highest consecutive years as an employee for each year of creditable service after June 30, 1998.

The Social Security Integration Level (SSIL) is the average of all Social Security Wage Bases over the thirty–five (35) calendar years prior to your retirement.

Employees' Pension System of the State of Maryland

Note: Members who transferred into the Employees' Pension System, on or after April 1, 1998, receive benefits based on the provisions of the NCPS as in effect on January 1, 1980 except for COLA benefits. The COLAs are capped at a maximum of 3% compounded annually.

RCPB Eligibility - Combined age and eligibility service of at least 90 years or age 65 after 10 years of eligibility service.

RCPB Allowance: 1.5% of average final compensation for the five highest consecutive years as an employee for each year of creditable service on or after July 1, 2011.

4. Early Retirement Allowance

NCPS, ECPS, and ACPS Eligibility: Attainment of age 55 and at least 15 years of eligibility service.

NCPS, ECPS, and ACPS Allowance: Service retirement allowance computed as of early retirement date, reduced by .005 for each month that early retirement date precedes age 62 (maximum reduction is 42%).

RCPB Eligibility: Attainment of age 60 with at least 15 years of eligibility service.

RCPB Allowance: Service retirement allowance computed as of early retirement date, reduced by .005 for each month that early retirement date precedes age 65 (maximum reduction is 30%).

5. Disability Retirement Allowance

Ordinary

Eligibility: Five years of eligibility service and certification of the medical board designated by the Board of Trustees that member is mentally or physically incapacitated from the performance of the normal duties of the member's position, and that incapacity is permanent.

Allowance: The benefit is the service retirement allowance computed on the basis that service continues until age 62 (age 65 for RCPB) without any change in the rate of earnable compensation. If disability occurs on or after age 62 (age 65 for RCPB), the benefit is based on creditable service at time of retirement.

Accidental

Eligibility: Certification of the medical board designated by the Board of Trustees that member is totally and permanently incapacitated from the performance of the normal duties of the member's position as the natural and proximate result of an accident that occurred in the actual performance of duty.

Allowance: The benefit is 66 2/3% of average final compensation for the three highest consecutive years (five years for RCPB) as a member, plus the annuity provided by accumulated member contributions. The maximum benefit cannot be greater than the average final compensation.

Employees' Pension System of the State of Maryland

6. Death Benefits

Eligibility: One year of eligibility service.

Benefit: One time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions. If member dies prior to accruing one year of service, payment is only the return of accumulated member contributions.

Spouse Law

Eligibility: Surviving spouse designated as the sole primary beneficiary and the deceased member was eligible to retire or had at least 25 years of eligibility service, or was at least 55 years old with at least 15 years of eligibility service.

Benefit: Surviving spouse may elect one time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions or a monthly allowance under Option 2 (100% survivor benefit).

Special Death Benefit

Eligibility: Killed in line of duty.

Benefit: 66 2/3% of average final compensation for the three highest consecutive years as a member payable to a surviving spouse, dependent children or dependent parents. Accumulated member contributions are paid to the designated beneficiary(ies). Beginning July 1, 2017, the duration of payments that may be made to dependent children receiving a special death benefit is extended to surviving nondisabled children until each child turns 26 years old. Disabled children receiving a special death benefit may receive a special death benefit as long as they remain disabled.

Note: Death benefits outlined above are payable upon death of an active member. If member is not active, only accumulated member contributions are payable at time of death.

7. Vested Retirement Allowance

NCPS, ECPS, and ACPS Eligibility: Five years of eligibility service.

NCPS, ECPS, and ACPS Allowance: Accrued retirement allowance payable at age 62. A member who has completed 15 years of eligibility service may begin to receive benefit payments at any time on or after attainment of age 55, reduced by .005 for each month that benefit commencement date precedes age 62.

If member does not commence to receive benefit payments, and dies before attaining age 62, only accumulated member contributions are returned.

RCPB Eligibility: Ten years of eligibility service.

Employees' Pension System of the State of Maryland

RCPB Allowance: Accrued retirement allowance payable at age 65 provided member does not withdraw accumulated contributions. A member who has completed 15 years of eligibility service may begin to receive benefit payments at any time on or after attainment of age 60, reduced by .005 for each month that benefit commencement date precedes age 65.

If member does not commence to receive benefit payments, and dies before attaining age 65, only accumulated member contributions are returned.

8. Cost-of-Living Adjustments (COLA)

Retirement allowances may be adjusted each year based on the Consumer Price Index (CPI). Effective July 1, 1998, the adjustment is capped at a maximum of 3% compounded COLA, and is applied to all benefits which have been in payment for one year. All adjustments are effective July 1.

Retirement allowances of NCPS retirees (retirees of participating employers who did not elect the ECPS or ACPS) have a COLA that is capped at a maximum of 3% of the initial benefit. The COLA is applied to all benefits which have been in payment for one year. All adjustments are effective July 1.

For benefits attributable to service on or after July 1, 2011, the Cost-of-living adjustment is capped at the lesser of 2.5% or the increase in CPI if the most recent calendar year market value rate of return was greater than or equal to the assumed rate of investment return from the most recent actuarial valuation. The adjustment is capped at the lesser of 1% or the increase in CPI if the most recent calendar year market value rate of return was less than the assumed rate of investment return from the most recent actuarial valuation.

9. Optional Forms of Payment

Normal service allowance is in a single life annuity.

- Option 1: Cash refund equal to excess of present value of retirement allowance at date of retirement minus total amount of payments made to date of death.
- Option 2: 100% joint and survivor annuity. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 3: 50% joint and survivor annuity.
- Option 4: This option guarantees a return of accumulated member contributions remaining at date of death.

Employees' Pension System of the State of Maryland

- Option 5: 100% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 6: 50% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree.

For Option 5 and 6 – If the designated beneficiary predeceases the retiree, a new beneficiary may be named. However, the retirement allowance will be re-calculated.

Retirees who are to receive a service retirement, early service retirement, disability benefit, or vested allowance of less than \$50 a month may elect to receive a lump-sum payment equal to the present value in lieu of a monthly benefit.

10. Reduction for Benefits Payable Under Workers' Compensation

Disability retirement allowances, excluding annuity reserves and COLA, are reduced for workers' compensation benefits payable after retirement from injury occurring during employment by the State, if the workers' compensation benefits are for the same injury for which disability retirement was granted and are paid for the same period of time for which the retirement benefits are paid.

State Police Retirement System of the State of Maryland

1. Membership

Membership is a condition of employment for all officers of the Maryland State Police. The Superintendent of the Maryland State Police may elect membership in this System or the Employees' Pension System.

2. Member Contributions

Members are required to contribute 8% of earnable compensation.

Contributions earn interest at 4% per year.

3. Service Retirement Allowance

Eligibility: For individuals who are members on or before June 30, 2011, 22 years of eligibility service or attainment of age 50. For individuals who become members on or after July 1, 2011, 25 years of eligibility service or attainment of age 50. Retirement at age 60 is mandatory for all but the Superintendent.

Allowance: For individuals who are members on or before June 30, 2011, 2.55% of average final compensation for the three highest years as a member for each of the first 28 years of creditable service. For individuals who become members on or after July 1, 2011, 2.55% of average final compensation for the five highest years as a member for each of the first 28 years of creditable service. Maximum benefit is 71.4% of average final compensation.

4. Early Retirement Allowance

Not applicable to this System.

5. Disability Retirement Allowance

Ordinary

Eligibility: Five years of eligibility service and certification of the medical board designated by the Board of Trustees that member is mentally or physically incapacitated from the performance of the normal duties of the member's position, and that incapacity is permanent.

Allowance: 2.55% of average final compensation for the three highest years as a member for each of the first 28 years of creditable service. Minimum payable is 35% of average final compensation.

Special (Accidental)

Eligibility: Total and permanent disability as certified by the medical board arising out of or in the course of the actual performance of duty.

State Police Retirement System of the State of Maryland

Allowance: The benefit is 66 2/3% of average final compensation plus the annuity provided by accumulated member contributions with a maximum of average final compensation.

6. Death Benefits

Normal

Eligibility: 1 through 2 years of eligibility service and not eligible for special death benefit as noted below.

Benefit: One time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions. If member dies prior to accruing one year of service, payment is only the return of accumulated member contributions.

Special Death Benefit

Eligibility: More than two years of eligibility service or death in the performance of duty.

Benefit: Accumulated member contributions paid to designated beneficiary plus an allowance of one-half (two-thirds if death arises out of or in the course of the actual performance of duty) of the member's average final compensation. Payment is made to the surviving spouse; however, if there is no surviving spouse or spouse dies before youngest child reaches age 26, one-half of average final compensation continues until the youngest child reaches age 26. If the child is disabled, the benefit will continue past age 26 as long as the child remains disabled. If there is no surviving spouse or children under the age of 26, or disabled children older than age 26, payment is made to dependent parents. If none of the above conditions is met, the normal death benefit is paid to the designated beneficiary.

Note: Death benefits outlined above are payable upon death of an active member. If member is not active, only accumulated member contributions are payable at time of death, unless benefit payment has commenced.

7. Vested Retirement Allowance

Eligibility: For individuals who are members on or before June 30, 2011, 5 years of eligibility service. For individuals who become member on or after July 1, 2011, 10 years of eligibility service.

Allowance: Service retirement allowance payable at age 50.

8. Cost-of-Living Adjustments (COLA)

Retirement allowances may be adjusted each year based on the Consumer Price Index (CPI). Unlimited compounded COLAs are effective July 1 and are applied to all benefits which have been in payment for one year.

State Police Retirement System of the State of Maryland

For benefits attributable to service on or after July 1, 2011, the Cost-of-living adjustment is capped at the lesser of 2.5% or the increase in CPI if the most recent calendar year market value rate of return was greater than or equal to the assumed rate of investment return from the most recent actuarial valuation. The adjustment is capped at the lesser of 1% or the increase in CPI if the most recent calendar year market value rate of return was less than the assumed rate of investment return from the most recent actuarial valuation.

In years in which COLAs would be less than zero due to a decline in the CPI, retirement allowances will not be adjusted. COLAs in succeeding years are adjusted until the difference between the negative COLA that would have applied and the zero COLA is fully recovered.

Retirees and beneficiaries receiving a retirement allowance on or before June 30, 1999, who receive an annual adjustment to their benefit ranging from \$1,200 to \$2,100 may receive separate COLAs on this adjustment commencing effective July 1, 2000.

9. Optional Forms of Payment

Normal service allowance is 80% joint and survivor annuity with spouse, if any. If there is no surviving spouse or upon the death of the surviving spouse, payment is made to any children of the deceased retiree under the age of 18 years, until each child becomes age 18. If there is no spouse at time of retirement, member may select an optional allowance.

- Option 1: Cash refund equal to excess of present value of retirement allowance at date of retirement minus total amount of payments made to date of death.
- Option 2: 100% joint and survivor annuity. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 3: 50% joint and survivor annuity.
- Option 4: This option guarantees a return of accumulated member contributions remaining at date of death.
- Option 5: 100% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 6: 50% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree.

For Option 5 and 6 – If the designated beneficiary predeceases the retiree, a new beneficiary may be named. However, the retirement allowance will be re-calculated.

State Police Retirement System of the State of Maryland

10. Reduction for Benefits Payable Under Workers' Compensation

Disability retirement allowances, excluding annuity reserves and COLA, are reduced for workers' compensation benefits payable after retirement from injury occurring during employment if the workers' compensation benefits are for the same injury for which disability retirement was granted and are paid for the same period of time for which the retirement benefits are paid.

11. Deferred Retirement Option Program (DROP)

For members who are less than 60 years old and who enter DROP on or before June 30, 2011, DROP participation is the lesser of 5 years or the difference between 30 years and the member's creditable service. For members who are less than 60 years old and who enter DROP on or after July 1, 2011, DROP participation is the lesser of 5 years or the difference between 30 years and the member's creditable service. Members who enter DROP are retired and cease making member contributions, and cease accruing service credit and additional benefits. For members who enter DROP on or before June 30, 2011, the service retirement allowance, with COLAs, is credited to an account earning interest at the rate of 6% per year, compounded monthly. For members who enter DROP on or after July 1, 2011, the service retirement allowance, with COLAs, is credited to an account earning interest at the rate of 4% per year, compounded annually. When the DROP period ends, members terminate employment and begin receiving their monthly allowance plus the lump sum payment from their DROP account. During the DROP period, members remain eligible for Special Disability benefits if incapacitated while in DROP.

Judges Retirement System of the State of Maryland*

1. Membership

Membership is a condition of employment for a judge of the Court of Appeals, Court of Special Appeals, Circuit Court, or District Court of Maryland. Members of the State Workers' Compensation Commission also participate.

2. Member Contributions

Members are required to make contributions of 6% of salary until they have accrued 16 years of service credit. Beginning July 1, 2012, members are required to make contributions of 8% of salary until they have accrued 16 years of service credit.

Contributions earn interest at 4% per year.

3. Service Retirement Allowance

Eligibility: For an individual who is a member of the Judges' Retirement System before July 1, 2012: (1) upon attainment of age 60; or (2) retired by order of the Court of Appeals. For an individual who joins the Judges' Retirement System on or after July 1, 2012: (1) upon the attainment of age 60 and at least 5 years of eligibility service; (2) by order of the Court of Appeals; or (3) at the mandatory retirement age required by the Maryland Constitution with less than five years of service, if the member has eligibility service equal to the mandatory retirement age minus the member's age when the member joined the Judges' Retirement System.

Allowance: $66 \frac{2}{3}\%$ of current judicial salary for 16 years of service. With less than 16 years, the benefit is prorated based on the ratio of years of service to 16.

4. Early Retirement Allowance

Not applicable to this System.

5. Disability Retirement Allowance

Eligibility: Certification of the medical board designated by the Board of Trustees that member is incapacitated for the performance of duty, and that incapacity is permanent.

Allowance: Same as service allowance payable immediately. However, if a judge has at least three years of service, the pension will not be less than $\frac{1}{3}$ of the judge's salary.

Judges Retirement System of the State of Maryland

6. Death Benefits

Monthly Allowance

Eligibility: Death of a judge or former judge at any age, leaving a surviving spouse or dependent children under the age of 26, or a child who is disabled.

Allowance: 50% of the pension that would have been payable to the judge or former judge at the date of death as if the judge or former judge was eligible to receive a retirement allowance is payable to surviving spouse. If there is no spouse, payment is paid to children until age 26. If the child is disabled, the benefit will continue past age 26 as long as the child remains disabled.

Lump Sum

Eligibility: Termination of service by death of a judge leaving no spouse, or children under age 26.

Allowance: Annual salary at time of death plus return of accumulated member contributions paid to designated beneficiary.

7. Deferred Vested Allowance

Eligibility: For individuals who are members before July 1, 2012, termination of service prior to age 60. For individuals who join the Judges' Retirement System on or after July 1, 2012, five years of eligibility service. For individuals joining the Judges' Retirement System on or after July 1, 2012 who are required to retire due to mandatory retirement and have less than 5 years of service at that time, eligibility service equal to 70 minus the member's age when the individuals first become members of the System.

Allowance: Same as service allowance payable at age 60.

In lieu of a deferred vested allowance pension, a former judge may elect to withdraw accumulated contributions following the judge's termination of service.

8. Cost-of-Living Adjustments

Allowances are recalculated each time the salary for a sitting judge from the Court from which the judge retired increases.

NOTE: Masters who retire from the Judges' Retirement System receive COLA benefits equal to the percentage increase in salary provided to judges of the Circuit Court.

Judges Retirement System of the State of Maryland

9. Optional Forms of Payment

Normal service allowance is 50% joint and survivor annuity with spouse. However, a judge or former judge, who at the time of retirement, does not have a spouse or eligible minor children, may elect one of the following optional forms of payment:

- Option 1: Cash refund equal to excess of present value of retirement allowance at date of retirement minus total amount of payments made to date of death.
- Option 2: 100% joint and survivor annuity. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 3: 50% joint and survivor annuity.
- Option 4: This option guarantees a return of accumulated member contributions remaining at date of death.
- Option 5: 100% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 6: 50% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree.

For Option 5 and 6 – If the designated beneficiary predeceases the retiree, a new beneficiary may be named. However, the retirement allowance will be re-calculated.

Special note: After retirement neither the option nor designation of beneficiary may be changed.

Law Enforcement Officers Pension System of the State of Maryland (Retirement Plan)

A. Retirement System Provisions

1. Membership

The retirement tier was closed to new participants effective January 1, 2005.

2. Member Contributions

Members who transferred from Employees' Retirement System (Plan A) are required to contribute 7% of earnable compensation. Members who transferred from the Employees' Retirement System (Plan B) contribute 5% of earnable compensation.

Contributions earn interest at 4% per year.

3. Service Retirement Allowance

Eligibility: 25 years of eligibility service or attainment of age 50.

Allowance: 2.3% of average final compensation for the three highest years as a member for each of the first 30 years of creditable service, plus 1.0% of average final compensation for each additional year.

4. Early Retirement Allowance

Not applicable to this System.

5. Disability Retirement Allowance

Ordinary

Eligibility: Five years of eligibility service and certification of the medical board designated by the Board of Trustees that member is incapacitated for the performance of duty, and that incapacity is permanent.

Allowance: Service retirement allowance with a minimum of 25% of average final compensation.

Accidental

Eligibility: Total and permanent disability as certified by the medical board arising out of or in the course of the actual performance of duty.

Law Enforcement Officers Pension System of the State of Maryland (Retirement Plan)

Allowance: The benefit is 66 2/3% of average final compensation plus an annuity provided by accumulated contributions with a maximum of average final compensation.

6. Death Benefits

Ordinary

Eligibility: 1 through 2 years of eligibility service and not eligible for special death benefit.

Benefit: Member's annual earnable compensation at time of death plus accumulated contributions.

Regardless of length of service, members' accumulated contributions are paid.

Special Benefit

Eligibility: More than two years of eligibility service or death in the performance of duty.

Benefit: Accumulated contributions paid to designated beneficiary plus an allowance of 50% of the ordinary disability benefit. Payment is made to the surviving spouse; however if there is no surviving spouse or spouse dies before youngest child reaches age 26, one-half of average final compensation continues until the youngest child reaches age 26. If the child is disabled, the benefit will continue past age 26 as long as the child remains disabled. If none of the above conditions is met, the ordinary death benefit is paid to the designated beneficiary.

Eligibility: Death arises out of or in the course of the actual performance of duty.

Benefit: Accumulated contributions paid to designated beneficiary plus an allowance of 66 2/3% of the member's average final compensation. Payment is made to the surviving spouse; however if there is no surviving spouse or spouse dies before youngest child reaches age 26, one-half of average final compensation continues until the youngest child reaches age 26. If the child is disabled, the benefit will continue past age 26 as long as the child remains disabled. If none of the above conditions is met, the ordinary death benefit is paid to the designated beneficiary.

Note: Death benefits outlined above are payable upon death of an active member. If member is not active, only member accumulated contributions and interest are payable at time of death, unless benefit payment has commenced.

Law Enforcement Officers Pension System of the State of Maryland (Retirement Plan)

7. Vested Retirement Allowance

Eligibility: Five years of eligibility service.

Allowance: Accrued retirement allowance payable at age 50 if the member does not withdraw the member's accumulated contributions.

8. Cost-of-Living Adjustments (COLA)

Retirement allowances may be adjusted each year based on the Consumer Price Index (CPI). COLAs are effective July 1 and are applied to all benefits which have been in payment for one year. For members contributing 7% of earnable compensation, unlimited COLA is compounded annually. For members contributing 5% of earnable compensation, the cost-of-living adjustment is capped at a maximum 5% compounded annually.

In years in which COLAs would be less than zero due to a decline in the CPI, retirement allowances will not be adjusted. COLAs in succeeding years are adjusted until the difference between the negative COLA that would have been applied and the zero COLA is fully recovered.

9. Optional Forms of Payment

The normal service allowance is a 50% joint and survivor annuity with spouse, if any; or if there is no surviving spouse or upon the death of the surviving spouse, to any children of the deceased under the age of 26 years, until every child dies or becomes 26 years old. If the child is disabled, the benefit will continue past age 26 as long as the child remains disabled.

Other forms of payment may be elected if there is no spouse at time of retirement.

- Option 1: Cash refund equal to excess of present value of retirement allowance at date of retirement minus total amount of payments made to date of death.
- Option 2: 100% joint and survivor annuity. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 3: 50% joint and survivor annuity.
- Option 4: This option guarantees a return of accumulated member contributions remaining at date of death.
- Option 5: 100% "pop-up" joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.

Law Enforcement Officers Pension System of the State of Maryland (Retirement Plan)

Option 6: 50% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree.

For Option 5 and 6 – If the designated beneficiary predeceases the retiree, a new beneficiary may be named. However, the retirement allowance will be re-calculated.

10. Reduction for Benefits Payable under Workers’ Compensation

Disability retirement allowances, excluding the annuity reserves and COLA, are reduced for workers’ compensation benefits payable after retirement from injury occurring during employment with the State, if the workers’ compensation benefits are for the same injury for which disability retirement was granted and are paid for the same period of time for which the retirement benefits are paid.

11. Deferred Retirement Option Program (DROP)

Members with 25 years of eligibility service, but less than 30 years of eligibility service, may elect to enter the DROP program for no more than five years. Members who enter DROP are retired and cease making member contributions, and cease accruing service credit and additional benefits. For members who enter DROP on or before June 30, 2011, the service retirement allowance, with annual COLAs, is credited to an account earning interest at the rate of 6% per year, compounded monthly. For members who enter DROP on or after July 1, 2011, the service retirement allowance, with COLAs, is credited to an account earning interest at the rate of 4% per year, compounded annually. When the DROP period ends, members terminate employment and begin receiving their monthly allowance plus the lump sum payment from their DROP account. During the DROP period, members remain eligible for Accidental Disability benefits if incapacitated while in DROP.

Law Enforcement Officers Pension System of the State of Maryland

B. Pension System Provisions

1. Membership

Membership is a condition of employment for all law enforcement officers who are employees of the State as provided in the Annotated Code of Maryland, State Personnel and Pensions Article, Title 26, Section 26-201. This includes participating governmental units who elect to have their law enforcement officers or firefighters/paramedics participate in the System.

2. Member Contributions

Members are required to contribute 7% of earnable compensation.

Contributions earn interest at 5% per year.

3. Service Retirement Allowance

Eligibility: 25 years of eligibility service or attainment of age 50.

Allowance: For individuals who are members on or before June 30, 2011, 2.0% of average final compensation for the three highest consecutive years as an employee for each of the first 32.5 years of creditable service. For individuals who are members on or after July 1, 2011, 2.0% of average compensation for the five highest consecutive years as an employee for each of the first 32.5 years of creditable service. For individuals who are members of the Law Enforcement Officers' Pension System on July 1, 2018, the maximum benefit is 65% of average final compensation. For individuals who retired from the Law Enforcement Officers' Pension System before July 1, 2018, the maximum benefit was 60% of average final compensation.

4. Early Retirement Allowance

Not applicable to this System.

5. Disability Retirement Allowance

Ordinary

Eligibility: Five years of eligibility service and certification of the medical board designated by the Board of Trustees that member is incapacitated for the performance of duty, and that incapacity is permanent.

Allowance: Service retirement allowance computed on the basis that service continues until age 50 without any change in rate of earnable compensation. If disability occurs after age 50, the benefit is based on creditable service at time of retirement.

Law Enforcement Officers Pension System of the State of Maryland

Accidental

Eligibility: Total and permanent disability as certified by the medical board arising out of or in the course of the actual performance of duty.

Allowance: The benefit is 66 2/3% of average final compensation plus an annuity provided by accumulated member contributions with a maximum of average final compensation.

6. Death Benefits

Normal

Eligibility: 1 through 2 years of eligibility service and not eligible for special death benefit as noted below.

Benefit: One time lump sum payment of member's annual earnable compensation at time of death plus accumulated member contributions. If member dies prior to accruing one year of service, payment is only the return of accumulated member contributions.

Special Death Benefit

Eligibility: More than two years of eligibility service or death in the performance of duty.

Benefit: Accumulated member contributions paid to designated beneficiary plus an allowance of 50% of the ordinary disability benefit. Payment is made to the surviving spouse; however if there is no surviving spouse or spouse dies before youngest child reaches age 26, one-half of average final compensation continues until the youngest child reaches age 26. If none of the above conditions are met, the ordinary death benefit is paid to the designated beneficiary(ies).

Eligibility: Death arises out of or in the course of the actual performance of duty.

Benefit: Accumulated member contributions paid to designated beneficiary plus an allowance of 66 2/3% of the member's average final compensation. Payment is made to the surviving spouse; however if there is no surviving spouse or spouse dies before youngest child reaches age 26, one-half of average final compensation continues until the youngest child reaches age 26. If none of the above conditions are met, the ordinary death benefit is paid to the designated beneficiary(ies).

Note: Death benefits outlined above are payable upon death of an active member. If member is not active, only accumulated member contributions are payable at time of death, unless benefit payment has commenced.

Law Enforcement Officers Pension System of the State of Maryland

7. Vested Retirement Allowance

Eligibility: For individuals who are members on or before June 30, 2011, 5 years of eligibility service. For individuals who become members on or after July 1, 2011, 10 years of eligibility service.

Allowance: Accrued retirement allowance payable at age 50 if the member does not withdraw their accumulated member contributions.

8. Cost-of-Living Adjustments (COLA)

Retirement allowances may be adjusted each year based on the Consumer Price Index (CPI). Effective July 1, 2000, the adjustment is capped at a maximum 3% compounded and is applied to all benefits which have been in payment for one year. All adjustments are effective July 1.

For benefits attributable to service on or after July 1, 2011, the Cost-of-living adjustment is capped at the lesser of 2.5% or the increase in CPI if the most recent calendar year market value rate of return was greater than or equal to the assumed rate of investment return from the most recent actuarial valuation. The adjustment is capped at the lesser of 1% or the increase in CPI if the most recent calendar year market value rate of return was less than the assumed rate of investment return from the most recent actuarial valuation.

In years in which COLAs would be less than zero due to a decline in the CPI, retirement allowances will not be adjusted. COLAs in succeeding years are adjusted until the difference between the negative COLA that would have applied and the zero COLA is fully recovered.

9. Optional Forms of Payment

The normal service allowance is a 50% joint and survivor annuity with spouse, if any; or if there is no surviving spouse or upon the death of the surviving spouse, to any children of the deceased under the age of 26 years, until every child dies or becomes 26 years of age. If the child is disabled, the benefit will continue past age 26 as long as the child remains disabled.

Other forms of payment may be elected if there is no spouse at time of retirement.

Option 1: Cash refund equal to excess of present value of retirement allowance at date of retirement minus total amount of payments made to date of death.

Option 2: 100% joint and survivor annuity. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.

Option 3: 50% joint and survivor annuity.

Law Enforcement Officers Pension System of the State of Maryland

- Option 4: This option guarantees a return of accumulated member contributions remaining at date of death.
- Option 5: 100% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree. Your named beneficiary cannot be more than 10 years younger than you unless the beneficiary is your spouse or disabled child.
- Option 6: 50% “pop-up” joint and survivor annuity with adjustment to maximum benefit if beneficiary predeceases retiree.

For Option 5 and 6 – If the designated beneficiary predeceases the retiree, a new beneficiary may be named. However, the retirement allowance will be re-calculated.

10. Reduction for Benefits Payable under Workers’ Compensation

Disability retirement allowances, excluding the annuity reserves and COLA, are reduced for workers’ compensation benefits payable after retirement from injury occurring during employment with the State if the workers’ compensation benefits are for the same injury for which disability retirement was granted and are paid for the same period of time for which the retirement benefits are paid.

11. Deferred Retirement Option Plan (DROP)

DROP participation is the lesser of 5 years or the difference between 30 years and the member’s creditable service. Members who enter DROP are retired and cease making member contributions, and cease accruing service credit and additional benefits. For members who enter DROP on or before June 30, 2011, the service retirement allowance, with annual COLAs, is credited to an account earning interest at the rate of 6% per year, compounded monthly. For members who enter DROP on or after July 1, 2011, the service retirement allowance, with annual COLAs, is credited to an account earning interest at the rate of 4% per year, compounded annually. When the DROP period ends, members terminate employment and begin receiving their monthly allowance plus the lump sum payment from their DROP account. During the DROP period, members remain eligible for Accidental Disability benefits if incapacitated while in DROP.