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**PERA**

Public Employees  
Retirement Association  
of New Mexico

**INVESTED IN TOMORROW.**

**Public Employees Retirement Association (PERA)  
of New Mexico  
Annual Actuarial Valuation  
as of June 30, 2018**





# Cavanaugh Macdonald

CONSULTING, LLC

*The experience and dedication you deserve*

October 25, 2018

The Retirement Board  
Public Employees Retirement Association  
Santa Fe, New Mexico

Members of the Board:

We have conducted the annual actuarial valuation of the Public Employees Retirement Association (PERA) of New Mexico as of June 30, 2018; the results of the valuation are contained in the following report. The annual valuation is used to determine the sufficiency of the statutory contribution rates and, if necessary, the amount required to fund the annual normal cost and amortize the unfunded actuarial accrued liability over a 30-year period. The results of this valuation apply to the fiscal year beginning July 1, 2018 and ending June 30, 2019 (FY 2019). Information contained in our report for plan years prior to June 30, 2010 is based upon valuations performed by the association's prior actuary.

In performing the valuation, we relied on data supplied by the Public Employees Retirement Association (PERA) and performed limited tests on the data for consistency and reasonableness. In determining the Fund's liabilities, future events, such as investment returns, deaths, retirements, etc., are anticipated based upon the set of actuarial assumptions as approved by the Board. New economic assumptions were adopted for the June 30, 2018 valuations as follows:

Assumption	Previous	Current
Rate of Inflation	2.25% select and 2.75% ultimate	2.50% static
Investment Rate of Return	7.25% select and 7.75% ultimate	7.25% static
Rate of Payroll Growth	2.75% select and 3.25% ultimate	3.00% static
Administrative Expenses	0.45% of payroll	0.50% of payroll



In addition, new demographic assumptions and methods were adopted for the June 30, 2018 valuation as follows:

<b>Summary of Changes</b>	
<b>Withdrawal</b>	Minor changes to Muni Police and Muni Fire divisions which reduce rates after 7 years of service.
<b>Retirement</b>	Changes to current assumed rates of retirement that reduce the number of expected retirements.
<b>Mortality</b>	Adoption of the RPH-2014 Blue Collar mortality table with female ages set forward one year. Future improvement in mortality rates is assumed using 60% of the MP-2017 projection scale generationally.
<b>Disability</b>	Lowered rates for State Police, Muni General males, and Muni Police divisions.
<b>Salary Increase Above Wage Inflation</b>	Changes to the service based rates of salary increases which generally reflect lower rates of salary growth.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: fund experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This actuarial valuation was performed to determine the adequacy of statutory contributions to fund the plan. The asset values used to determine unfunded liabilities and funded ratios are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts and funded ratios using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return on assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.



This is to certify that the undersigned are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the Fund.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'John J. Garrett', with a long horizontal flourish extending to the right.

John J. Garrett, ASA, FCA, MAAA  
Principal and Consulting Actuary

A handwritten signature in blue ink, appearing to read 'Jonathan T. Craven', with a long horizontal flourish extending to the right.

Jonathan T. Craven, ASA, EA, FCA, MAAA  
Consulting Actuary



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## Section I: Board Summary

The table below summarizes the results of the June 30, 2018 actuarial valuation as compared with the prior year.

**Table I-1(a): Comparative Summary of Principal Results (All PERA Divisions)**

Valuation Date	June 30, 2018	June 30, 2017
Total Annual Payroll	\$ 2,221,079,274	\$ 2,204,414,890
Total Valuation Payroll	\$ 2,287,711,652	\$ 2,265,036,299
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 6,850,306,745	\$ 6,640,876,002
Retired Members and Survivors	<u>14,463,144,438</u>	<u>13,553,822,288</u>
Total	\$ 21,313,451,183	\$ 20,194,698,290
Actuarial Value of Assets	\$ 15,252,860,672	\$ 15,124,167,297
Funded Ratio	71.6 %	74.9 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 6,060,590,511	\$ 5,070,530,993
<b>Calculation of Required Contribution</b>		
Statutory Contribution Rate		
Employer Contribution Rate	14.81 %	14.86 %
Member Contribution Rate	<u>12.03 %</u>	<u>11.90 %</u>
Total	26.84 %	26.76 %
Less Normal Cost:		
Retirement	10.73 %	10.60 %
Termination	3.81 %	3.68 %
Pre-Retirement Survivors	1.10 %	0.56 %
Disability	<u>0.95 %</u>	<u>0.97 %</u>
Total Normal Cost	16.59 %	15.81 %
Less Administrative Expenses	0.50 %	0.45 %
Amount Remaining to Amortize UAAL	9.75 %	10.50 %
Amortization Period	Infinite	55 years
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	5.73 %	2.93 %



## Section I: Board Summary

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### Summary of Key Findings – PERA

An objective of the Board’s funding policy is to maximize the stability in the statutory contribution rates while maintaining the adequacy of funding necessary for the actuarial soundness of each Division in the Fund. The Board has set forth criteria for measuring actuarial soundness and making recommendations for adjustments to the statutory rates of each Division. The funding method for PERA determines the sufficiency of statutorily required contribution rates to fund the sum of the annual normal cost, administrative expenses and an amount to fully amortize the unfunded actuarial accrued liability (UAAL) over no more than 30 years for each Division.

The investment earnings of PERA is allocated on the basis of each Divisions’ share of the total PERA Fund balance as of the valuation date. Therefore, each Division shares in the asset experience of the total Fund and will demonstrate similar experience.

- The total PERA Fund experienced an investment return of approximately \$1.00 billion on the market value of assets. The actuarial value of assets smooth the unexpected portion of the market return over a four year period. The return on the actuarial value of assets was 4.85% compared to an expected return of 7.25%. As of June 30, 2018, the actuarial value of assets is 100.6% of market value. Table III-4 provides the development of the actuarial value of assets.
- Based a recent experience study for the five-year period ending June 30, 2017, the economic and demographic assumptions were updated for this valuation. The changes in assumptions resulted in an increase of \$564.0 million to Fund liabilities and a decrease of 1.95% to the funded ratio.
- The total actuarial loss due to the investment experience of the total PERA Fund is \$356.5 million. The gain on non-investment related items totaled \$55.9 million. The net loss due to the plan’s experience was \$300.6 million.
- The total increase to the UAAL of PERA is \$990.1 million since the previous valuation and the funded ratio decreased from 74.9% to 71.6%.
- The financing period for the unfunded liability based upon the statutory contribution rates is an infinite period.

The summary of results and discussion of key findings for each Division begins on the following page.

## Section I: Board Summary



**Table I-1(b): Comparative Summary of Principal Results (State General Division)**

Valuation Date	June 30, 2018	June 30, 2017
Total Annual Payroll	\$ 900,513,193	\$ 928,864,843
Total Valuation Payroll	\$ 927,528,589	\$ 954,408,626
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 2,846,188,979	\$ 2,838,047,375
Retired Members and Survivors	<u>6,349,256,438</u>	<u>5,973,769,583</u>
Total	\$ 9,195,445,417	\$ 8,811,816,958
Actuarial Value of Assets	\$ 5,799,854,720	\$ 5,831,916,099
Funded Ratio	63.1 %	66.2 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 3,395,590,697	\$ 2,979,900,859
<b>Calculation of Required Contribution</b>		
Statutory Contribution Rate		
Employer Contribution Rate	16.99 %	16.99 %
Member Contribution Rate	<u>8.92 %</u>	<u>8.92 %</u>
Total	25.91 %	25.91 %
Less Normal Cost:		
Retirement	9.74 %	9.89 %
Termination	3.68 %	3.52 %
Pre-Retirement Survivors	1.16 %	0.59 %
Disability	<u>1.15 %</u>	<u>1.05 %</u>
Total Normal Cost	15.73 %	15.05 %
Less Administrative Expenses	0.50 %	0.45 %
Amount Remaining to Amortize UAAL	9.68 %	10.41 %
Amortization Period	Infinite	Infinite
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	11.71 %	8.32 %





## Section I: Board Summary

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### Summary of Key Findings – State General Division

The UAAL increased from \$2.98 billion to \$3.40 billion. The funded ratio decreased from 66.2% to 63.1%. Table IV-3 provides the reconciliation of the UAAL. In the course of preparing the valuation report, we note the following key findings:

- The State General Division experienced a net actuarial loss of \$41.7 million during the plan year ended June 30, 2018. The non-investment related gain of \$99.1 million is primarily due to lower than expected salary increases and service credit changes. In addition the plan experienced a \$140.8 million loss due to investment related experience. Table IV-4 provides the detailed information on the sources and magnitude of actuarial gains and losses.
- The adoption of new economic and demographic assumptions resulted in a \$250.9 million increase in the UAAL.
- The financing period for the unfunded liability based upon the statutory contribution rates is an infinite period for the tenth consecutive year.

## Section I: Board Summary



**Table I-1(c): Comparative Summary of Principal Results (State Police/Corrections Division)**

Valuation Date	June 30, 2018	June 30, 2017
Total Annual Payroll	\$ 84,845,998	\$ 87,941,130
Total Valuation Payroll	\$ 87,391,378	\$ 90,359,511
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 275,833,201	\$ 270,894,903
Retired Members and Survivors	<u>670,133,517</u>	<u>638,978,282</u>
Total	\$ 945,966,718	\$ 909,873,185
Actuarial Value of Assets	\$1,231,975,474	\$1,196,338,715
Funded Ratio	130.2 %	131.5 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ (286,008,756)	\$ (286,465,530)
<b>Calculation of Required Contribution</b>		
Statutory Contribution Rate		
Employer Contribution Rate	25.58 %	25.58 %
Member Contribution Rate	<u>8.75 %</u>	<u>8.73 %</u>
Total	34.33 %	34.31 %
Less Normal Cost:		
Retirement	16.09 %	14.75 %
Termination	4.12 %	3.75 %
Pre-Retirement Survivors	0.75 %	0.50 %
Disability	<u>1.79 %</u>	<u>1.81 %</u>
Total Normal Cost	22.75 %	20.81 %
Less Administrative Expenses	0.50 %	0.45 %
Amount Remaining to Amortize UAAL	11.08 %	13.05 %
Amortization Period	0	0
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	N/A	N/A



## Section I: Board Summary

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### Summary of Key Findings – State Police/Corrections Division

As of June 30, 2018, the actuarial value of assets exceeded accrued liabilities by \$286.0 million. As of June 30, 2017, the actuarial value of assets exceeded accrued liabilities by \$286.5 million. This represents an increase in the UAAL of about \$0.5 million from the previous year. The funded ratio decreased from 131.5% to 130.2%. Table IV-3 provides the reconciliation of the UAAL. In the course of preparing the valuation report, we note the following key findings:

- The State Police/Corrections Division experienced a net actuarial loss of \$4.3 million during the plan year ended June 30, 2018. The actuarial loss is comprised of a \$27.1 million investment related loss and a \$22.8 million gain due to non-investment related experience, primarily due to salary increases greater than expected. Table IV-4 provides the detailed information on the sources and magnitude of actuarial gains and losses.
- The adoption of new economic and demographic assumptions resulted in a \$26.8 million increase in the UAAL.

## Section I: Board Summary



**Table I-1(d): Comparative Summary of Principal Results (Municipal General Division)**

Valuation Date	June 30, 2018	June 30, 2017
Total Annual Payroll	\$ 901,617,649	\$ 871,633,574
Total Valuation Payroll	\$ 928,666,178	\$ 895,603,497
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 2,437,854,958	\$ 2,347,545,739
Retired Members and Survivors	<u>4,360,288,421</u>	<u>4,047,489,782</u>
Total	\$ 6,798,143,379	\$ 6,395,035,521
Actuarial Value of Assets	\$ 5,184,797,302	\$ 5,106,489,938
Funded Ratio	76.3 %	79.9 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 1,613,346,077	\$ 1,288,545,583
<b>Calculation of Required Contribution</b>		
Statutory Contribution Rate		
Employer Contribution Rate	9.78 %	9.73 %
Member Contribution Rate	<u>13.47 %</u>	<u>13.41 %</u>
Total	23.25 %	23.14 %
Less Normal Cost:		
Retirement	8.11 %	8.07 %
Termination	4.05 %	3.93 %
Pre-Retirement Survivors	1.20 %	0.56 %
Disability	<u>0.80 %</u>	<u>0.86 %</u>
Total Normal Cost	14.16 %	13.42 %
Less Administrative Expenses	0.50 %	0.45 %
Amount Remaining to Amortize UAAL	8.59 %	9.27 %
Amortization Period	43 years	26 years
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	1.56 %	N/A



## Section I: Board Summary

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### Summary of Key Findings – Municipal General Division

The UAAL increased from \$1.29 billion to \$1.61 billion. The current statutory rate will amortize the UAAL over a 43-year period. The funded ratio decreased from 79.9% to 76.3%. Table IV-3 provides the reconciliation of the UAAL. In the course of preparing the valuation report, we note the following key findings:

- The Municipal General Division experienced a net actuarial loss of \$158.9 million during the plan year ended June 30, 2018. The actuarial loss is comprised of a \$118.8 million investment related loss and a \$40.1 million loss due to non-investment related experience.
- The adoption of new economic and demographic assumptions resulted in a \$157.6 million increase in the UAAL.
- The amortization period increased from 26 years to 43 years.
- Table IV-5 provides the detailed information on the sources and magnitude of actuarial gains and losses.

## Section I: Board Summary



**Table I-1(e): Comparative Summary of Principal Results (Municipal Police Division)**

Valuation Date	June 30, 2018	June 30, 2017
Total Annual Payroll	\$ 206,898,932	\$ 196,767,735
Total Valuation Payroll	\$ 213,105,900	\$ 202,178,848
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 760,169,317	\$ 696,153,419
Retired Members and Survivors	<u>1,990,208,711</u>	<u>1,866,609,116</u>
Total	\$ 2,750,378,028	\$ 2,562,762,535
Actuarial Value of Assets	\$ 2,058,403,842	\$ 2,027,593,334
Funded Ratio	74.8 %	79.1 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 691,974,186	\$ 535,169,201
<b>Calculation of Required Contribution</b>		
Statutory Contribution Rate		
Employer Contribution Rate	18.66 %	18.66 %
Member Contribution Rate	<u>17.21 %</u>	<u>17.22 %</u>
Total	35.87 %	35.88 %
Less Normal Cost:		
Retirement	17.74 %	16.85 %
Termination	3.77 %	3.74 %
Pre-Retirement Survivors	0.71 %	0.51 %
Disability	<u>0.58 %</u>	<u>0.92 %</u>
Total Normal Cost	22.80 %	22.02 %
Less Administrative Expenses	0.50 %	0.45 %
Amount Remaining to Amortize UAAL	12.57 %	13.41 %
Amortization Period	Infinite	42 years
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	6.41 %	2.47 %



## Section I: Board Summary

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### Summary of Key Findings – Municipal Police Division

The UAAL increased from \$535.2 million to \$692.0 million. The funded ratio decreased from 79.1% to 74.8%. Table IV-3 provides the reconciliation of the UAAL. In the course of preparing the valuation report, we note the following key findings:

- The Municipal Police Division experienced a net actuarial loss of \$65.5 million and a 4.3% decrease to the funded ratio during the plan year ended June 30, 2018. The loss is comprised of a \$47.2 million investment related loss and an \$18.3 million loss due to non-investment related experience. Table IV-5 provides the detailed information on the sources and magnitude of actuarial gains and losses.
- The adoption of new economic and demographic assumptions resulted in an \$86.8 million increase in the UAAL.
- The financing period for the unfunded liability based upon the statutory contribution rates is infinite compared to 42 years for the plan year ended June 30, 2017.

## Section I: Board Summary



**Table I-1(f): Comparative Summary of Principal Results (Municipal Fire Division)**

Valuation Date	June 30, 2018	June 30, 2017
Total Annual Payroll	\$ 127,203,502	\$ 119,207,608
Total Valuation Payroll	\$ 131,019,607	\$ 122,485,817
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 530,260,290	\$ 488,234,566
Retired Members and Survivors	<u>1,093,257,351</u>	<u>1,026,975,525</u>
Total	\$ 1,623,517,641	\$ 1,515,210,091
Actuarial Value of Assets	\$ 977,829,334	\$ 961,829,211
Funded Ratio	60.2 %	63.5 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 645,688,307	\$ 553,380,880
<b>Calculation of Required Contribution</b>		
Statutory Contribution Rate		
Employer Contribution Rate	21.55 %	21.57 %
Member Contribution Rate	<u>17.55 %</u>	<u>17.58 %</u>
Total	39.10 %	39.15 %
Less Normal Cost:		
Retirement	21.37 %	21.22 %
Termination	2.90 %	2.92 %
Pre-Retirement Survivors	0.76 %	0.55 %
Disability	<u>0.56 %</u>	<u>0.50 %</u>
Total Normal Cost	25.59 %	25.19 %
Less Administrative Expenses	0.50 %	0.45 %
Amount Remaining to Amortize UAAL	13.01 %	13.51 %
Amortization Period	Infinite	Infinite
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	15.79 %	13.59 %





## Section I: Board Summary

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### Summary of Key Findings – Municipal Fire Division

The UAAL increased from \$553.4 million to \$645.7 million and the funded ratio decreased from 63.5 % to 60.2%. Table IV-3 provides the reconciliation of the UAAL. In the course of preparing the valuation report, we note the following key findings:

- The Municipal Fire Division experienced a net actuarial loss of \$30.2 million. The loss is comprised of a \$22.2 million investment related loss and an \$8.0 million loss due to non-investment related experience. Table IV-5 provides the detailed information on the sources and magnitude of actuarial gains and losses.
- The adoption of new economic and demographic assumptions resulted in a \$41.9 million increase in the UAAL.
- The financing period for the unfunded liability based upon the statutory contribution rates is an infinite period for the tenth consecutive year.

Section II of the report provides summarized information on the membership data used in the valuation. Section III covers the Fund's assets and Section IV covers the Fund's liabilities. The results of the valuation are provided in Section V and the accounting information is in Section VI. The appendices provide additional information on A) the Fund members, B) the actuarial assumptions and methods, and C) the summary of the benefit provisions of the Fund. It is important to note that all information contained in this report for periods prior to June 30, 2010 were produced by a prior actuarial consulting firm.



## Section II: Membership Data

Data regarding the membership of the Fund for use in the valuation were furnished by PERA. The following tables summarize the membership data as of June 30, 2018.

**Table II-1: Summary of Membership Data as of June 30, 2018**

Group	Count					Totals
	State General	State Police/ Corrections	Municipal General	Municipal Police	Municipal Fire	
<b>Total Active Members</b>	19,114	1,928	21,511	3,748	2,309	<b>48,610</b>
<b>Inactive Members</b>						
Deferred Vested	2,973	120	2,067	212	99	<b>5,471</b>
Other	4,792	407	6,628	471	172	<b>12,470</b>
<b>Total Inactive Members</b>	7,765	527	8,695	683	271	<b>17,941</b>
<b>Retirees</b>						
Service*	15,886	1,301	11,118	3,198	1,734	<b>33,237</b>
Disabled	706	49	561	65	15	<b>1,396</b>
Beneficiaries	2,178	203	1,836	335	189	<b>4,741</b>
<b>Total Retirees</b>	18,770	1,553	13,515	3,598	1,938	<b>39,374</b>
<b>Totals</b>	<b>45,649</b>	<b>4,008</b>	<b>43,721</b>	<b>8,029</b>	<b>4,518</b>	<b>105,925</b>

\* Counts include Co-Payees as follows:

State General - 346

State Police – 89

Municipal General - 333

Municipal Police - 268

Municipal Fire - 148

## Section II: Membership Data



**Table II-2: Summary of Active Membership Valuation Data**

Division	Number		Annual Payroll*		Average Salary	
	2018	2017	2018	2017	2018	2017
<b>State Division</b>						
General	19,114	19,213	\$ 900,513,193	\$ 928,864,843	\$47,113	\$48,346
Police	552	536	32,666,748	32,930,817	59,179	61,438
Adult Corrections	1,090	1,070	41,681,140	43,573,552	38,240	40,723
Juvenile Corrections	286	301	10,498,110	11,436,761	36,707	37,996
<b>Total State Division</b>	21,042	21,120	\$ 985,359,191	\$1,016,805,973	\$46,828	\$48,144
<b>Municipal Division</b>						
General Coverage Plans						
Plan 1	984	1,308	\$ 35,014,808	\$ 48,165,970	\$35,584	\$36,824
Plan 2	6,403	6,361	252,855,591	235,929,766	39,490	37,090
Plan 3	12,743	12,606	558,724,065	534,617,870	43,846	42,410
Plan 4	714	735	26,762,028	26,644,716	37,482	36,251
Detention Officers Plan 1	667	663	28,261,157	26,275,252	42,371	39,631
Total General	21,511	21,673	\$ 901,617,649	\$ 871,633,574	\$41,914	\$40,217
Police Coverage Plans						
Plan 1	105	110	\$ 4,744,770	\$ 4,634,739	\$45,188	\$42,134
Plan 2	60	60	2,750,179	2,458,661	45,836	40,978
Plan 3	62	65	2,982,425	2,734,191	48,104	42,064
Plan 4	133	132	6,370,159	5,924,929	47,896	44,886
Plan 5	3,388	3,359	190,051,399	181,015,215	56,095	53,890
Total Police	3,748	3,726	\$ 206,898,932	\$ 196,767,735	\$55,202	\$52,809
Fire Coverage Plans						
Plan 1	18	16	\$ 856,218	\$ 666,333	\$47,568	\$41,646
Plan 2	21	20	1,055,438	872,793	50,259	43,640
Plan 3	6	4	280,706	162,902	46,784	40,726
Plan 4	6	7	235,462	261,391	39,244	37,342
Plan 5	2,258	2,185	124,775,678	117,244,189	55,259	53,659
Total Fire	2,309	2,232	\$ 127,203,502	\$ 119,207,608	\$55,090	\$53,408
<b>Total Municipal Division</b>	27,568	27,631	\$1,235,720,083	\$1,187,608,917	\$44,824	\$42,981
<b>Total PERA</b>	48,610	48,751	\$2,221,079,274	\$2,204,414,890	\$45,692	\$45,218

\* Beginning with the 2016 valuation, annual payroll reflects the change from total to pensionable earnings.

## Section II: Membership Data



**Table II-3: Summary of Deferred Vested Members as of June 30, 2018**

Division	Number	Average Age	Average Service	Average Annual Benefit
<b>State Division</b>				
General	2,973	51.32	9.28	\$ 12,765
Police/Hazardous Duty	<u>120</u>	48.89	9.78	10,644
<b>Total State Division</b>	3,093	51.23	9.30	\$ 12,682
<b>Municipal Division</b>				
General	2,067	52.13	9.21	\$ 10,147
Police	212	45.58	9.17	14,392
Fire	<u>99</u>	44.01	7.27	11,430
<b>Total Municipal Division</b>	2,378	51.21	9.12	\$ 10,579
<b>PERA Totals</b>	<b>5,471</b>	<b>51.22</b>	<b>9.22</b>	<b>\$ 11,768</b>

## Section II: Membership Data



**Table II-4: Summary of Retirees and Survivors as of June 30, 2018**

Type of Retirement	Division					
	State General	State Police/ Corrections	Municipal General	Municipal Police	Municipal Fire	Total
<b>Service</b>						
Number	15,886	1,301	11,118	3,198	1,734	33,237
Total Annual Benefits	\$ 475,691,145	\$ 44,187,255	\$ 309,156,644	\$ 129,912,084	\$ 73,833,642	\$ 1,032,780,770
Avg Annual Benefit	\$ 29,944	\$ 33,964	\$ 27,807	\$ 40,623	\$ 42,580	\$ 31,073
Avg Age	69.52	63.57	68.67	59.98	62.05	67.69
<b>Disability</b>						
Number	706	49	561	65	15	1,396
Total Annual Benefits	\$ 12,327,204	\$ 865,417	\$ 9,663,624	\$ 1,692,347	\$ 420,611	\$ 24,969,203
Avg Annual Benefit	\$ 17,461	\$ 17,662	\$ 17,226	\$ 26,036	\$ 28,041	\$ 17,886
Avg Age	58.20	57.19	57.19	51.52	51.03	57.37
<b>Survivors</b>						
Number	2,178	203	1,836	335	189	4,741
Total Annual Benefits	\$ 40,923,090	\$ 4,820,462	\$ 32,200,576	\$ 9,011,037	\$ 6,007,741	\$ 92,962,906
Avg Annual Benefit	\$ 18,789	\$ 23,746	\$ 17,538	\$ 26,899	\$ 31,787	\$ 19,608
Avg Age	70.42	66.61	69.33	65.27	71.90	69.53
<b>Total</b>						
Number	18,770	1,553	13,515	3,598	1,938	39,374
Total Annual Benefits	\$ 528,941,439	\$ 49,873,134	\$ 351,020,844	\$ 140,615,468	\$ 80,261,994	\$ 1,150,712,879
Avg Annual Benefit	\$ 28,180	\$ 32,114	\$ 25,973	\$ 39,082	\$ 41,415	\$ 29,225
Avg Age	69.20	63.77	68.28	60.32	62.93	67.55

## Section II: Membership Data



**Table II-5: Summary of Historical Active Membership Valuation Data by Division**

Valuation Date	Number	Annual Payroll*	Average Annual Pay	% Change In Average Pay
<b>State General Division</b>				
6/30/2018	19,114	\$ 900,513,193	\$ 47,113	(2.55)%
6/30/2017	19,213	928,864,843	48,346	5.02 %
6/30/2016	19,655	904,829,688	46,036	(0.62)%
6/30/2015	20,253	938,168,776	46,322	7.33 %
6/30/2014	20,015	863,797,166	43,157	3.17 %
<b>State Police/Corrections Division</b>				
6/30/2018	1,928	\$ 84,845,998	\$ 44,007	(4.57)%
6/30/2017	1,907	87,941,130	46,115	10.00 %
6/30/2016	1,866	78,225,782	41,922	(19.04)%
6/30/2015	1,880	97,352,917	51,783	10.35 %
6/30/2014	1,951	91,551,934	46,926	1.73 %
<b>Municipal General Division</b>				
6/30/2018	21,511	\$ 901,617,649	\$ 41,914	4.22 %
6/30/2017	21,673	871,633,574	40,217	1.16 %
6/30/2016	21,274	845,735,646	39,754	(1.61)%
6/30/2015	21,217	857,243,239	40,404	6.51 %
6/30/2014	21,480	814,827,128	37,934	4.46 %
<b>Municipal Police Division</b>				
6/30/2018	3,748	\$ 206,898,932	\$ 55,202	4.53 %
6/30/2017	3,726	196,767,735	52,809	1.63 %
6/30/2016	3,708	192,670,656	51,961	(14.67)%
6/30/2015	3,647	222,085,818	60,895	7.32 %
6/30/2014	3,685	209,092,483	56,742	5.42 %
<b>Municipal Fire Division</b>				
6/30/2018	2,309	\$ 127,203,502	\$ 55,090	3.15 %
6/30/2017	2,232	119,207,608	53,408	2.86 %
6/30/2016	2,190	113,709,690	51,922	(15.31)%
6/30/2015	2,176	133,403,526	61,307	7.51 %
6/30/2014	2,157	122,996,614	57,022	6.05 %

**Table II-6: Summary of Historical Active Membership Valuation Data for All Divisions**

Valuation Date	Number	Annual Payroll*	Average Annual Pay	% Change In Average Pay
6/30/2018	48,610	\$ 2,221,079,274	\$ 45,692	1.05 %
6/30/2017	48,751	2,204,414,890	45,218	3.12 %
6/30/2016	48,693	2,135,171,462	43,850	(4.09)%
6/30/2015	49,173	2,248,254,276	45,721	7.19 %
6/30/2014	49,288	2,102,265,325	42,653	(0.36)%

\* Beginning with the 2016 valuation, annual payroll reflects the change from total to pensionable earnings.



### Section III: PERA Assets

The following tables provide a summary of PERA's market value and actuarial value of assets (excluding Legislative Division) as of June 30, 2018.

**Table III-1: Market Value Summary as of June 30, 2018**

Division	June 30, 2018	June 30, 2017
State General	\$ 5,767,630,979	\$ 5,690,516,137
State Police/Corrections	1,225,130,672	1,167,332,425
Municipal General	5,155,990,793	4,982,678,574
Municipal Police	2,046,967,440	1,978,432,541
Municipal Fire	972,396,557	938,508,811
<b>Total Market Value of Assets</b>	<b>\$ 15,168,116,441</b>	<b>\$ 14,757,468,488</b>

**Table III-2: Actuarial Value Summary as of June 30, 2018**

Division	June 30, 2018	June 30, 2017
State General	\$ 5,799,854,720	\$ 5,831,916,099
State Police/Corrections	1,231,975,474	1,196,338,715
Municipal General	5,184,797,302	5,106,489,938
Municipal Police	2,058,403,842	2,027,593,334
Municipal Fire	977,829,334	961,829,211
<b>Total Actuarial Value of Assets</b>	<b>\$ 15,252,860,672</b>	<b>\$ 15,124,167,297</b>



### Section III: PERA Assets

The following tables provide information on PERA's assets at market value and cash flow.

**Table III-3: Market Value Reconciliation (Total PERA with Legislature)**

	June 30, 2018	June 30, 2017
<b>Beginning of Year Market Value</b>	<b>\$ 14,798,917,909</b>	<b>\$ 13,826,658,367</b>
Audit Adjustment	(745,145)	6,447,404
<b>Revised Beginning of Year Market Value</b>	<b>\$ 14,798,172,764</b>	<b>\$ 13,833,105,771</b>
<b>Revenues:</b>		
a. Member Contributions	\$ 273,679,996	\$ 264,939,116
b. Employer Contributions	319,499,468	331,473,332
c. Appropriations	-	1,000,000
d. Purchases of Service	9,167,491	7,889,996
e. Investment Income		
1. Interest, dividends, etc.	367,541,008	313,099,791
2. Realized/Unrealized gains (losses)	694,887,277	1,240,713,990
3. Security lending and other gains (losses)	3,462,298	3,965,163
f. Other Income	2,109,772	470,441
g. Settlement Award	-	1,024
h. Total Revenues	\$ 1,670,347,310	\$ 2,163,552,853
<b>Expenditures :</b>		
a. Benefit Payments	\$ 1,133,417,826	\$ 1,084,818,276
b. Refunds of Member Contributions	50,288,373	44,396,305
c. Investment Expenses	61,663,978	57,020,360
d. Administrative Expenses	12,667,256	11,505,774
e. Total Expenditures	\$ 1,258,037,433	\$ 1,197,740,715
<b>End of Year Market Value</b>	<b>\$ 15,210,482,641</b>	<b>\$ 14,798,917,909</b>

The market value rate of return for the plan year is 6.92% on both an adjusted basis and an unadjusted basis. This return is based on a simplified dollar-weighted basis which may not match more precise time-weighted return calculations. PERA's cash flow is (3.94)% as a percentage of average market value. A mature system such as PERA is expected to exhibit negative net cash flow as the number of members receiving benefit payments becomes a larger portion of total membership. There are 1.23 contributing active members for each member receiving a benefit as of June 30, 2018. We expect this measure to decline over future years and result in an increase in the percentage of negative cash flow.





### Section III: PERA Assets

The actuarial value of assets represents a "smoothed" value developed with the purpose of dampening the impact of market volatility on the assets used in determining valuation results. The actuarial value of assets has been calculated by spreading the recognition of excess investment income over four years. The amount of excess investment income in each year is the difference between expected actuarial value investment income and actual market value investment income. Table III-4 provides the calculation of the amount of the current year excess investment income to be phased-in as well as the amount of deferred investment income from the prior years.

**Table III-4: Development of Actuarial Value of Assets as of June 30, 2018  
(Total PERA with Legislative Division)**

A. Actuarial Value Beginning of Year		\$	15,166,646,668
B. Market Value End of Year			15,210,482,641
C. Revised Market Value Beginning of Year			14,798,172,764
D. Cash Flow			
D1. Contributions & Appropriations		\$	593,179,464
D2. Service Purchases			9,167,491
D3. Benefit Payments and Refunds			(1,183,706,199)
D4. Administrative Expenses			(12,667,256)
D5. Other			2,109,772
D6. Net		\$	(591,916,728)
E. Investment Income			
E1. Market Total (B - C - D6)		\$	1,004,226,605
E2. Assumed Rate			7.25%
E3. Amount for Immediate Recognition			1,078,124,902
E4. Amount for Phased-In Recognition			(73,898,297)
F. Phased-In Recognition of Investment Income			
F1. Current Year: 0.25 *E4		\$	(18,474,574)
F2. First Prior Year (2016/2017)	\$ 454,743,664 x 25%		113,685,916
F3. Second Prior Year (2015/2016)	(1,027,716,151) x 25%		(256,929,038)
F4. Third Prior Year (2014/2015)	(779,713,717) x 25%		(194,928,429)
F5. Total Recognized Investment Gain		\$	(356,646,125)
G. Audit Adjustment		\$	(745,145)
<b>H. Actuarial Value End of Year</b>			<b>\$15,295,463,572</b>
(A + D6 + E3 + F5 + G)			
I. Difference Between Market & Actuarial Values		\$	(84,980,931)
<b>J. Rate of Return on Actuarial Value</b>			<b>4.85 %</b>
<b>K. Actuarial Value as a Percentage of Market Value</b>			<b>100.56 %</b>

## Section III: PERA Assets



**Table III-5: Allocation of Actuarial Value by Division as of June 30, 2018**

	State Division		PERA Totals w/o Legislative
	General	Police	
Member Contribution Fund	\$ 892,279,750	\$ 67,111,945	\$ 2,593,248,439
Employer Contribution Fund	1,675,044,217	400,799,331	4,079,191,895
Retirement Reserve Fund	3,200,307,012	757,219,396	8,495,676,107
<b>Total Fund Balances</b>	<b>\$ 5,767,630,979</b>	<b>\$ 1,225,130,672</b>	<b>\$ 15,168,116,441</b>
Approximate % of Total Fund Balance*	38.02%	8.08%	100%
Actuarial Value Adjustment*	32,223,741	6,844,802	84,744,231
<b>Total Actuarial Value of Assets</b>	<b>\$ 5,799,854,720</b>	<b>\$ 1,231,975,474</b>	<b>\$ 15,252,860,672</b>

	Municipal Division			PERA Totals w/o Legislative
	General	Police	Fire	
Member Contribution Fund	\$ 1,137,899,276	\$ 289,967,593	\$ 205,989,875	\$ 2,593,248,439
Employer Contribution Fund	1,267,015,114	526,441,689	209,891,544	4,079,191,895
Retirement Reserve Fund	2,751,076,403	1,230,558,158	556,515,138	8,495,676,107
<b>Total Fund Balances</b>	<b>\$ 5,155,990,793</b>	<b>\$ 2,046,967,440</b>	<b>\$ 972,396,557</b>	<b>\$ 15,168,116,441</b>
Approximate % of Total Fund Balance*	33.99%	13.50%	6.41%	100.00%
Actuarial Value Adjustment*	28,806,509	11,436,402	5,432,777	84,744,231
<b>Total Actuarial Value of Assets</b>	<b>\$ 5,184,797,302</b>	<b>\$ 2,058,403,842</b>	<b>\$ 977,829,334</b>	<b>\$ 15,252,860,672</b>

\* The actuarial value adjustment is the difference between the actuarial value of assets derived in Table III-4 and the total fund balance at market value. It was allocated to each group in proportion to the Total PERA Fund Balance. Please note that the Legislature Division accounted for approximately 0.28% of the Total PERA Fund Balance and is detailed in a separate report.



### Section III: PERA Assets

The actuarial valuation assumes the rate of investment return on the assets of the Plan is 7.25% annually. This assumption is based upon the reasonable long-term expected return on the assets. In each year, the Fund will experience actuarial gains and losses due to the actual investment return of the assets. Table III-6 provides the calculation of the gain or loss due to the investment experience on the actuarial value of assets for the year ended June 30, 2018.

**Table III-6: Actuarial Investment Gain (Loss) for the Year Ending June 30, 2018**  
(Dollar Amounts in Millions)

	State General	State Police/ Corrections	Municipal General	Municipal Police	Municipal Fire	Total
1. Beginning of Year Actuarial Value of Assets (AVA)	\$ 5,831.9	\$ 1,196.3	\$ 5,106.5	\$ 2,027.6	\$ 961.8	\$ 15,124.2
2. Employee and Employer Contributions	237.4	29.1	205.9	79.0	50.8	602.3
3. Benefit Payments	(536.4)	(51.4)	(369.4)	(144.2)	(80.5)	(1,181.8)
4. Administrative Expenses	(4.8)	(1.0)	(4.3)	(1.7)	(0.8)	(12.5)
5. Other	0.8	0.2	0.7	0.3	0.1	2.1
6. Interest [1 x 7.25% + (2 + 3 + 4 + 5) x 7.25% x 0.5]	411.8	85.9	364.2	144.6	68.6	1,075.1
7. Expected End of Year AVA	\$ 5,940.7	\$ 1,259.1	\$ 5,303.6	\$ 2,105.6	\$ 1,000.0	\$ 15,609.4
8. Actual End of Year AVA	5,799.9	1,232.0	5,184.8	2,058.4	977.8	15,252.9
<b>9. Actuarial Investment Gain (Loss) (8 - 7)</b>	<b>\$ (140.8)</b>	<b>\$ (27.1)</b>	<b>\$ (118.8)</b>	<b>\$ (47.2)</b>	<b>\$ (22.2)</b>	<b>\$ (356.5)</b>



## Section III: PERA Assets

### Statutory Reserve Transfers

Each year following receipt of the report of the annual actuarial valuation, the excess, if any, of the actuarial present value of pensions and refunds being paid or likely to be paid to members and survivors over the balance in the retirement reserve fund (RRF) shall be transferred to the retirement reserve fund from the employers accumulation fund (EAF). Table III-7 shows the necessary transfer amounts.

**Table III-7: Statutory Reserve Transfers as of June 30, 2018**

Division	Reported Fund Balances	Actuarial Present Value of Pensions Being Paid	Transfer
<b>State General</b>			
Members Contribution Fund	\$ 892,279,750		
Employers Accumulation Fund	1,675,044,217		\$ (3,148,949,426)
Retirement Reserve Fund	3,200,307,012	\$ 6,349,256,438	3,148,949,426
<b>State Police/Corrections</b>			
Members Contribution Fund	67,111,945		
Employers Accumulation Fund	400,799,331		-
Retirement Reserve Fund	757,219,396	670,133,517	-
<b>Municipal General</b>			
Members Contribution Fund	1,137,899,276		
Employers Accumulation Fund	1,267,015,114		(1,609,212,018)
Retirement Reserve Fund	2,751,076,403	4,360,288,421	1,609,212,018
<b>Municipal Police</b>			
Members Contribution Fund	289,967,593		
Employers Accumulation Fund	526,441,689		(759,650,553)
Retirement Reserve Fund	1,230,558,158	1,990,208,711	759,650,553
<b>Municipal Fire</b>			
Members Contribution Fund	205,989,875		
Employers Accumulation Fund	209,891,544		(536,742,213)
Retirement Reserve Fund	556,515,138	1,093,257,351	536,742,213
<b>Total End of Year Market Value</b>	<b>\$ 15,168,116,441</b>		



## Section IV: PERA Liabilities

The total actuarial present value of benefits is the value as of the valuation date of all future benefits expected to be paid to current members of the Fund. An actuarial cost method allocates each individual's present value of benefits to past and future years of service. The actuarial accrued liability includes the portion of the active member present value of benefits allocated to past service as well as the entire present value of benefits for retirees, beneficiaries and inactive members. The portion of the actuarial present value allocated to the future service of active members is called the present value of future normal costs. Table IV-1 presents the calculation and allocation of the actuarial present value of benefits.

**Table IV-1: Calculation and Allocation of the Actuarial Present Value as of June 30, 2018**

	Actuarial Accrued Liability	Present Value of Future Normal Cost	Total Actuarial Present Value
<b>Active Members</b>			
Service Retirement	\$ 5,816,078,766	\$ 1,795,496,955	\$ 7,611,575,721
Termination Benefits	285,898,485	654,344,155	940,242,640
Survivor Benefits	182,006,516	170,853,989	352,860,505
Disability Retirement	93,415,576	155,075,319	248,490,895
Total for Active Members	\$ 6,377,399,343	\$ 2,775,770,418	\$ 9,153,169,761
<b>Inactive Members</b>	\$ 472,907,402		\$ 472,907,402
<b>Retirees and Beneficiaries</b>			
Service Retirements	\$ 13,109,120,279		\$ 13,109,120,279
Beneficiaries	960,817,408		960,817,408
Disability Retirements	393,206,751		393,206,751
Total for Retirees and Beneficiaries	\$ 14,463,144,438		\$ 14,463,144,438
<b>Total</b>	<b>\$ 21,313,451,183</b>	<b>\$ 2,775,770,418</b>	<b>\$ 24,089,221,601</b>

Under the valuation funding method, an unfunded actuarial accrued liability (UAAL) exists to the extent that the actuarial accrued liability exceeds the actuarial value of assets as presented in Section III. The calculation of the UAAL by Division as of the valuation date is shown in Table IV-2 on the following page.



## Section IV: PERA Liabilities

**Table IV-2: Calculation of the Unfunded Actuarial Accrued Liability and Funded Ratio**  
(Dollar Amounts in Millions)

	State General	State Police/ Corrections	Municipal General	Municipal Police	Municipal Fire
1. Actuarial Accrued Liability	\$ 9,195.4	\$ 946.0	\$ 6,798.1	\$ 2,750.4	\$ 1,623.5
2. Actuarial Value of Assets	5,799.9	1,232.0	5,184.8	2,058.4	977.8
3. Unfunded Actuarial Accrued Liability (1-2)	3,395.5	(286.0)	1,613.3	692.0	645.7
Funded Ratio (2 / 1)	63.1%	130.2%	76.3%	74.8%	60.2%

Although the terminology used to describe the excess of PERA’s actuarial accrued liability over the actuarial value of assets is call the “unfunded” actuarial accrued liability, the calculated annual contribution rates in the valuation include an annual amortization payment required to fully amortize the UAAL within 30 years. In some cases, the current statutory rates are less than these calculated rates.

The funded ratio is the ratio of the actuarial value of assets (Table III-2) divided by the actuarial accrued liability (Table IV-1) as of the valuation date. As of June 30, 2018, the funded ratio of PERA is 71.6% as compared to a ratio of 74.9% as of June 30, 2017. The ratio is a commonly used measure of the funding progress and can be useful in reviewing the historical trend of a Fund’s funding progress. Such a review should also consider the impact to this measure over the historical period due to changes to fund benefits, changes to the actuarial assumptions and methods, and the significant impact that investment experience can have on the ratio over short-term periods. We caution that no single “point in time” measure can provide a universal basis for comparing one plan’s funded status to another.



## Section IV: PERA Liabilities

The calculation of PERA's actuarial assets and liabilities requires the use of several assumptions concerning the future experience of PERA and its members. In each annual valuation, the latest year of actual experience is compared to that expected by the prior valuation. The differences are actuarial gains and losses which decrease or increase the UAAL. Table IV-3 provides the reconciliation of the UAAL.

**Table IV-3: Reconciliation of the UAAL**  
(Dollar Amounts in Millions)

	State General	State Police/ Corrections	Municipal General	Municipal Police	Municipal Fire
1. Beginning of Year UAAL	\$ 2,979.9	\$ (286.5)	\$ 1,288.5	\$ 535.2	\$ 553.4
2. Normal Cost	143.6	18.8	120.2	44.5	30.9
3. Contributions	(237.4)	(29.1)	(205.9)	(79.0)	(50.8)
4. Other Income/Expense	4.0	0.8	3.6	1.4	0.7
5. Interest [ (1 x 7.25%) + (2 + 3 + 4) x 7.25% x 0.5 ]	212.8	(21.1)	90.4	37.6	39.4
6. Expected End of Year	3,102.9	(317.1)	1,296.8	539.7	573.6
7. Assumption Changes	250.9	26.8	157.6	86.8	41.9
8. Other Changes	0	0	0	0	0
9. Expected UAAL after changes (6 + 7 + 8)	3,353.8	(290.3)	1,454.4	626.5	615.5
10. Actual UAAL	3,395.5	(286.0)	1,613.3	692.0	645.7
11. Total Actuarial Gain (Loss)	(41.7)	(4.3)	(158.9)	(65.5)	(30.2)

Tables IV-4 and IV-5 on the following pages provide details of the sources of actuarial gains and losses for state divisions and municipal divisions, respectively.

## Section IV: PERA Liabilities



**Table IV-4: Actuarial Gains & Losses by Source for State Divisions**  
(Dollar Amounts in Millions)

Source	State General			State Police/Corrections		
	UAAL	Funded Ratio	Contribution Rate*	UAAL	Funded Ratio	Contribution Rate*
<b>Expected Value</b>	<b>\$3,102.9</b>	<b>65.7 %</b>	<b>19.55 %</b>	<b>(\$317.1)</b>	<b>133.7 %</b>	<b>(21.20)%</b>
Retirement	(\$27.0)	0.2 %	(0.54)%	\$0.1	0.0 %	0.01 %
Disability	\$1.2	0.0 %	0.02 %	(\$0.2)	0.0 %	(0.01)%
Pre-Retirement Death	(\$2.6)	0.0 %	(0.05)%	(\$0.2)	0.0 %	(0.01)%
Withdrawal	(\$1.0)	0.0 %	(0.02)%	(\$3.7)	0.4 %	(0.28)%
Pay Increases	(\$135.5)	1.0 %	(2.73)%	(\$20.3)	2.3 %	(1.51)%
New Entrants	\$29.4	(0.2)%	0.59 %	\$4.6	(0.5)%	0.33 %
Post-Retirement Death	\$11.2	(0.1)%	0.23 %	(\$3.2)	0.4 %	(0.24)%
Data Adjustments	\$27.3	(0.2)%	0.55 %	\$0.3	0.0 %	0.02 %
Other	(\$2.1)	0.0 %	(0.04)%	(\$0.2)	0.0 %	(0.01)%
Investment Return	\$140.8	(1.6)%	2.83 %	\$27.1	(2.9)%	2.02 %
<b>Total (Gain) or Loss</b>	<b>\$41.7</b>	<b>(0.9)%</b>	<b>0.84 %</b>	<b>\$4.3</b>	<b>(0.3)%</b>	<b>0.32 %</b>
Assumption Changes	\$250.9	(1.7)%	1.00 %	\$26.8	(3.2)%	1.76 %
Other Changes	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %
<b>Actual Value</b>	<b>\$3,395.5</b>	<b>63.1 %</b>	<b>21.39 %</b>	<b>(\$286.0)</b>	<b>130.2 %</b>	<b>(19.12)%</b>

\* Impact on Contribution Rate based on 30 year period and valuation payroll.



## Section IV: PERA Liabilities



**Table IV-5: Actuarial Gains & Losses by Source for Municipal Divisions**  
(Dollar Amounts in Millions)

Source	Municipal General			Municipal Police			Municipal Fire		
	UAAL	Funded Ratio	Contribution Rate*	UAAL	Funded Ratio	Contribution Rate*	UAAL	Funded Ratio	Contribution Rate*
<b>Expected Value</b>	<b>\$1,296.8</b>	<b>80.4 %</b>	<b>8.16 %</b>	<b>\$539.7</b>	<b>79.6 %</b>	<b>14.80 %</b>	<b>\$573.6</b>	<b>63.5 %</b>	<b>25.58 %</b>
Retirement	(\$14.9)	0.2 %	(0.12)%	(\$0.7)	0.0 %	(0.02)%	(\$0.6)	0.0 %	(0.04)%
Disability	\$1.8	0.0 %	0.01 %	\$1.6	0.0 %	0.06 %	\$0.0	0.0 %	0.00 %
Pre-Retirement Death	(\$2.8)	0.0 %	(0.02)%	(\$0.5)	0.0 %	(0.02)%	(\$0.3)	0.0 %	(0.02)%
Withdrawal	(\$1.3)	0.0 %	(0.01)%	\$5.4	(0.1)%	0.19 %	\$6.8	(0.2)%	0.48 %
Pay Increases	(\$4.1)	0.1 %	(0.03)%	(\$0.4)	0.0 %	(0.01)%	(\$6.0)	0.2 %	(0.42)%
New Entrants	\$35.3	(0.4)%	0.28 %	\$9.7	(0.3)%	0.34 %	\$3.7	(0.1)%	0.26 %
Post-Retirement Death	\$4.4	(0.1)%	0.04 %	\$1.3	0.0 %	0.05 %	\$1.5	(0.1)%	0.11 %
Data Adjustments	\$22.7	(0.3)%	0.18 %	\$2.6	(0.1)%	0.07 %	\$3.2	(0.1)%	0.21 %
Other	(\$1.0)	0.0 %	(0.01)%	(\$0.7)	0.0 %	(0.02)%	(\$0.3)	0.0 %	(0.02)%
Investment Return	\$118.8	(1.8)%	0.95 %	\$47.2	(1.8)%	1.64 %	\$22.2	(1.4)%	1.57 %
<b>Total (Gain) or Loss</b>	<b>\$158.9</b>	<b>(2.3)%</b>	<b>1.27 %</b>	<b>\$65.5</b>	<b>(2.3)%</b>	<b>2.28 %</b>	<b>\$30.2</b>	<b>(1.7)%</b>	<b>2.13 %</b>
Assumption Changes	\$157.6	(1.8)%	0.72 %	\$86.8	(2.5)%	1.90 %	\$41.9	(1.6)%	1.09 %
Other Changes	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %
<b>Actual Value</b>	<b>\$1,613.3</b>	<b>76.3 %</b>	<b>10.15 %</b>	<b>\$692.0</b>	<b>74.8 %</b>	<b>18.98 %</b>	<b>\$645.7</b>	<b>60.2 %</b>	<b>28.80 %</b>

\* Impact on Contribution Rate based on 30 year period and valuation payroll.



## Section V: Actuarial Funding Calculation

Section IV of this report presented PERA's actuarial accrued liability as the portion of the present value of benefits allocated to past years of service. The portion of the active members' present value of benefits allocated to future years of service is funded through annual normal cost contributions comprised of both active member and employer contributions.

The annual required contribution rate is the percentage of valuation payroll necessary to fund the annual normal cost of the Fund and fully amortize the UAAL over 30 years in accordance with the Board's funding objectives. The calculated rate is expected to remain constant over the remaining amortization period and is provided in Table V-1.

**Table V-1(a): Valuation Results for State General Division**

	June 30, 2018	June 30, 2017
1. Total Valuation Payroll	\$ 927,528,589	\$ 954,408,626
2. Present Value of Future Benefits	10,219,925,047	9,784,272,274
3. Present Value of Future Normal Costs	1,024,479,630	972,455,316
4. Actuarial Accrued Liability (2 - 3)	\$9,195,445,417	\$8,811,816,958
5. Actuarial Value of Assets	5,799,854,720	5,831,916,099
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$3,395,590,697	\$2,979,900,859
7. UAAL Amortization Payment (30 year funding)	\$ 198,427,902	\$ 178,763,250
a. Amortization Payment as a Percent of Payroll (7 / 1)	21.39 %	18.73 %
8. Total Normal Cost	\$ 145,925,699	\$ 143,634,918
a. Normal Cost as a Percent of Payroll (8 / 1)	15.73 %	15.05 %
9. Expected Administrative Expenses	\$ 4,637,643	\$ 4,294,839
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.50 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 348,991,244	\$ 326,693,007
a. ADC Rate (7a + 8a + 9a)	37.62 %	34.23 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	16.99 %	16.99 %
b. Member Contribution Rate	<u>8.92 %</u>	<u>8.92 %</u>
c. Total Statutory Contribution Rate (a + b)	25.91 %	25.91 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	11.71 %	8.32 %

## Section V: Actuarial Funding Calculation



**Table V-1(b): Valuation Results for State Police/Correction Division**

	June 30, 2018	June 30, 2017
1. Total Valuation Payroll	\$ 87,391,378	\$ 90,359,511
2. Present Value of Future Benefits	1,106,047,043	1,052,355,342
3. Present Value of Future Normal Costs	160,080,325	142,482,157
4. Actuarial Accrued Liability (2 - 3)	\$ 945,966,718	\$ 909,873,185
5. Actuarial Value of Assets	1,231,975,474	1,196,338,715
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$(286,008,756)	\$(286,465,530)
7. UAAL Amortization Payment (30 year funding)	\$ (16,713,474)	\$ (17,184,971)
a. Amortization Payment as a Percent of Payroll (7 / 1)	(19.12)%	(19.02)%
8. Total Normal Cost	\$ 19,879,816	\$ 18,799,517
a. Normal Cost as a Percent of Payroll (8 / 1)	22.75 %	20.81 %
9. Expected Administrative Expenses	\$ 436,957	\$ 406,618
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.50 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 3,603,299	\$ 2,021,164
a. ADC Rate (7a + 8a + 9a)	4.13 %	2.24 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	25.58 %	25.58 %
b. Member Contribution Rate	<u>8.75 %</u>	<u>8.73 %</u>
c. Total Statutory Contribution Rate (a + b)	34.33 %	34.31 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	(30.20)%	(32.07)%

## Section V: Actuarial Funding Calculation



**Table V-1(c): Valuation Results for Municipal General Division**

	June 30, 2018	June 30, 2017
1. Total Valuation Payroll	\$ 928,666,178	\$ 895,603,497
2. Present Value of Future Benefits	7,732,647,850	7,185,676,363
3. Present Value of Future Normal Costs	<u>934,504,471</u>	<u>790,640,842</u>
4. Actuarial Accrued Liability (2 - 3)	\$6,798,143,379	\$6,395,035,521
5. Actuarial Value of Assets	<u>5,184,797,302</u>	<u>5,106,489,938</u>
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$1,613,346,077	\$1,288,545,583
7. UAAL Amortization Payment (30 year funding)	\$ 94,278,995	\$ 77,299,416
a. Amortization Payment as a Percent of Payroll (7 / 1)	10.15 %	8.63 %
8. Total Normal Cost	\$ 131,545,530	\$ 120,210,367
a. Normal Cost as a Percent of Payroll (8 / 1)	14.16 %	13.42 %
9. Expected Administrative Expenses	\$ 4,643,331	\$ 4,030,216
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.50 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 230,467,856	\$ 201,539,999
a. ADC Rate (7a + 8a + 9a)	24.81 %	22.50 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	9.78 %	9.73 %
b. Member Contribution Rate	<u>13.47 %</u>	<u>13.41 %</u>
c. Total Statutory Contribution Rate (a + b)	23.25 %	23.14 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	1.56 %	(0.64)%

## Section V: Actuarial Funding Calculation



**Table V-1(d): Valuation Results for Municipal Police Division**

	June 30, 2018	June 30, 2017
1. Total Valuation Payroll	\$ 213,105,900	\$ 202,178,848
2. Present Value of Future Benefits	3,124,368,877	2,897,672,780
3. Present Value of Future Normal Costs	373,990,849	334,910,245
4. Actuarial Accrued Liability (2 - 3)	\$2,750,378,028	\$2,562,762,535
5. Actuarial Value of Assets	2,058,403,842	2,027,593,334
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$ 691,974,186	\$ 535,169,201
7. UAAL Amortization Payment (30 year funding)	\$ 40,436,848	\$ 32,104,620
a. Amortization Payment as a Percent of Payroll (7 / 1)	18.98 %	15.88 %
8. Total Normal Cost	\$ 48,588,408	\$ 44,513,769
a. Normal Cost as a Percent of Payroll (8 / 1)	22.80 %	22.02 %
9. Expected Administrative Expenses	\$ 1,065,530	\$ 909,805
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.50 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 90,090,786	\$ 77,528,194
a. ADC Rate (7a + 8a + 9a)	42.28 %	38.35 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	18.66 %	18.66 %
b. Member Contribution Rate	<u>17.21 %</u>	<u>17.22 %</u>
c. Total Statutory Contribution Rate (a + b)	35.87 %	35.88 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	6.41 %	2.47 %

## Section V: Actuarial Funding Calculation



**Table V-1(e): Valuation Results for Municipal Fire Division**

	June 30, 2018	June 30, 2017
1. Total Valuation Payroll	\$ 131,019,607	\$ 122,485,817
2. Present Value of Future Benefits	1,906,232,784	1,763,577,872
3. Present Value of Future Normal Costs	282,715,143	248,367,781
4. Actuarial Accrued Liability (2 - 3)	\$1,623,517,641	\$1,515,210,091
5. Actuarial Value of Assets	977,829,334	961,829,211
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$ 645,688,307	\$ 553,380,880
7. UAAL Amortization Payment (30 year funding)	\$ 37,732,044	\$ 33,197,133
a. Amortization Payment as a Percent of Payroll (7 / 1)	28.80 %	27.10 %
8. Total Normal Cost	\$ 33,528,110	\$ 30,851,817
a. Normal Cost as a Percent of Payroll (8 / 1)	25.59 %	25.19 %
9. Expected Administrative Expenses	\$ 655,098	\$ 551,186
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.50 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 71,915,252	\$ 64,600,136
a. ADC Rate (7a + 8a + 9a)	54.89 %	52.74 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	21.55 %	21.57 %
b. Member Contribution Rate	<u>17.55 %</u>	<u>17.58 %</u>
c. Total Statutory Contribution Rate (a + b)	39.10 %	39.15 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	15.79 %	13.59 %

## Section V: Actuarial Funding Calculation



**Table V-1(f): Valuation Results for All PERA Divisions**

	June 30, 2018	June 30, 2017
1. Total Valuation Payroll	\$ 2,287,711,652	\$ 2,265,036,299
2. Present Value of Future Benefits	24,089,221,601	22,683,554,631
3. Present Value of Future Normal Costs	2,775,770,418	2,488,856,341
4. Actuarial Accrued Liability (2 - 3)	\$21,313,451,183	\$20,194,698,290
5. Actuarial Value of Assets	15,252,860,672	15,124,167,297
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$ 6,060,590,511	\$ 5,070,530,993
7. UAAL Amortization Payment (30 year funding)	\$ 354,162,315	\$ 304,179,449
a. Amortization Payment as a Percent of Payroll (7 / 1)	15.48 %	13.43 %
8. Total Normal Cost	\$ 379,467,564	\$ 358,010,389
a. Normal Cost as a Percent of Payroll (8 / 1)	16.59 %	15.81 %
9. Expected Administrative Expenses	\$ 11,438,558	\$ 10,192,663
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.50 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 745,068,437	\$ 672,382,501
a. ADC Rate (7a + 8a + 9a)	32.57 %	29.69 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	14.81 %	14.86 %
b. Member Contribution Rate	12.03 %	11.90 %
c. Total Statutory Contribution Rate (a + b)	26.84 %	26.76 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	5.73 %	2.93 %

**Table V-2: Contribution Rate Summary**

Division	Employer Only		
	Current Statutory Rate	30-year Rate	(Excess)/ Shortfall
State General	16.99 %	28.70 %	11.71 %
State Police/Corrections	25.58 %	(4.62)%	(30.20)%
Municipal General	9.78 %	11.34 %	1.56 %
Municipal Police	18.66 %	25.07 %	6.41 %
Municipal Fire	21.55 %	37.34 %	15.79 %
<b>PERA Total</b>	<b>14.81 %</b>	<b>20.54 %</b>	<b>5.73 %</b>

## Section V: Actuarial Funding Calculation



**Table V-3: Statutory Contribution Rate Summary**

Division and Coverage Plan	Contribution Rates	
	Member	Employer
<b>State Division</b>		
General Coverage Plan 3	8.92 %	16.99 %
Police and Adult Corrections Plan 1	9.10 %	25.50 %
Hazardous Duty (Juvenile Correctional Officers) Plan 2	6.28 %	26.12 %
Weighted Average for Police/Corrections*	8.75 %	25.58 %
<b>Municipal Division</b>		
General Coverage Plans		
Plan 1	8.50 %	7.40 %
Plan 2	10.65 %	9.55 %
Plan 3	14.65 %	9.55 %
Plan 4	17.15 %	12.05 %
Detention Officers Plan 1	18.15 %	17.05 %
Weighted Average*	13.47 %	9.78 %
Police Coverage Plans		
Plan 1	8.50 %	10.40 %
Plan 2	8.50 %	15.40 %
Plan 3	8.50 %	18.90 %
Plan 4	13.85 %	18.90 %
Plan 5	17.80 %	18.90 %
Weighted Average*	17.21 %	18.66 %
Fire Coverage Plans		
Plan 1	9.50 %	11.40 %
Plan 2	9.50 %	17.90 %
Plan 3	9.50 %	21.65 %
Plan 4	14.30 %	21.65 %
Plan 5	17.70 %	21.65 %
Weighted Average*	17.55 %	21.55 %

\* PERA financial records do not provide an asset breakdown by coverage plan which necessitates the use of a weighted average contribution rate for the purpose of comparing assets to the actuarial accrued liability and determining the financing period for the unfunded actuarial accrued liability. Contribution rates are weighted by payroll.





## Section VI: Additional Disclosure Information

The tables provided in this section present information relevant for the annual financial reporting of PERA. GASB Statement No. 67 required disclosure information will be provided in a separate supplemental report. Additional disclosure information is provided below.

**Table VI-1: Schedule of Funding Progress**

Actuarial Valuation Date	Actuarial Value of Plan Assets (a)	Actuarial Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Annual Payroll*	UAAL as a Percentage of Annual Payroll ((b - a) / c)
6/30/2018	\$ 15,252,860,672	\$ 21,313,451,183	\$6,060,590,511	71.6 %	\$2,221,079,274	272.9 %
6/30/2017	15,124,167,297	20,194,698,290	5,070,530,993	74.9 %	2,204,414,890	230.0 %
6/30/2016	14,654,814,373	19,474,241,384	4,819,427,011	75.3 %	2,135,171,462	225.7 %
6/30/2015	14,074,919,042	18,786,486,550	4,711,567,508	74.9 %	2,248,254,276	209.6 %
6/30/2014	13,482,815,522	17,784,376,686	4,301,561,164	75.8 %	2,102,265,325	204.6 %
6/30/2013	12,438,151,665	17,057,380,022	4,619,228,357	72.9 %	2,049,737,510	225.4 %
6/30/2012	11,612,047,019	17,788,043,847	6,175,996,828	65.3 %	1,994,280,107	309.7 %
6/30/2011	11,855,217,373	16,826,392,409	4,971,175,036	70.5 %	1,935,013,761	256.9 %
6/30/2010	12,243,712,850	15,601,461,460	3,357,748,610	78.5 %	1,993,516,921	168.4 %
6/30/2009	12,553,985,916	14,908,279,200	2,354,293,284	84.2 %	2,081,259,498	113.1 %
6/30/2008	12,816,218,012	13,740,335,321	924,117,309	93.3 %	1,965,064,160	47.0 %

\* Beginning with the 2016 valuation, annual payroll reflects the change from total to pensionable earnings.



**Section VI: Additional Disclosure Information**

**Table VI-2: Solvency Test by Division**

**State General**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)			(1)	(2)	(3)
6/30/2018	\$ 892,279,750	\$ 6,620,228,801	\$ 1,682,936,866	\$ 5,799,854,720	100.00%	74.13%	0.00%	
6/30/2017	878,994,137	6,218,179,179	1,714,643,642	5,831,916,099	100.00	79.65	0.00	
6/30/2016	853,069,949	6,055,630,306	1,620,222,312	5,720,834,981	100.00	80.38	0.00	
6/30/2015	849,806,169	5,646,053,464	1,705,146,120	5,549,137,149	100.00	83.23	0.00	
6/30/2014	826,785,813	5,390,816,297	1,568,388,787	5,334,025,804	100.00	83.61	0.00	

**State Police/Corrections**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)			(1)	(2)	(3)
6/30/2018	\$ 67,111,945	\$ 677,224,121	\$ 201,630,652	\$ 1,231,975,474	100.00%	100.00%	100.00%	
6/30/2017	64,332,242	645,636,929	199,904,014	1,196,338,715	100.00	100.00	100.00	
6/30/2016	59,921,229	635,036,352	180,402,152	1,136,076,589	100.00	100.00	100.00	
6/30/2015	58,543,902	595,623,306	236,967,557	1,075,204,637	100.00	100.00	100.00	
6/30/2014	57,705,918	569,659,307	222,557,567	1,016,533,008	100.00	100.00	100.00	

**Section VI: Additional Disclosure Information**



**Municipal General**

Valuation Date	Aggregate Accrued Liabilities For			Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 1,137,899,276	\$ 4,528,287,174	\$ 1,131,956,929	\$ 5,184,797,302	100.00%	89.37%	0.00%
6/30/2017	1,104,575,618	4,191,453,200	1,099,006,703	5,106,489,938	100.00	95.48	0.00
6/30/2016	1,053,649,176	4,071,034,047	1,035,772,981	4,916,985,846	100.00	94.90	0.00
6/30/2015	1,033,953,619	3,756,083,836	1,069,558,300	4,696,871,223	100.00	97.52	0.00
6/30/2014	1,023,202,668	3,548,792,552	965,182,192	4,515,120,417	100.00	98.40	0.00

**Municipal Police**

Valuation Date	Aggregate Accrued Liabilities For			Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 289,967,593	\$ 2,011,087,857	\$ 449,322,578	\$ 2,058,403,842	100.00%	87.93%	0.00%
6/30/2017	275,702,207	1,882,156,157	404,904,171	2,027,593,334	100.00	93.08	0.00
6/30/2016	260,474,657	1,810,426,144	382,129,648	1,952,310,191	100.00	93.45	0.00
6/30/2015	258,992,011	1,649,950,363	493,438,566	1,865,190,859	100.00	97.35	0.00
6/30/2014	249,816,375	1,551,716,281	462,032,152	1,772,210,104	100.00	98.11	0.00

**Municipal Fire**

Valuation Date	Aggregate Accrued Liabilities For			Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 205,989,875	\$ 1,099,223,887	\$ 318,303,879	\$ 977,829,334	100.00%	70.22%	0.00%
6/30/2017	194,507,068	1,033,070,516	287,632,507	961,829,211	100.00	74.28	0.00
6/30/2016	175,510,949	1,026,377,371	254,584,111	928,606,766	100.00	73.37	0.00
6/30/2015	171,569,805	934,914,512	325,885,020	888,515,174	100.00	76.69	0.00
6/30/2014	162,999,130	893,055,155	291,666,492	844,926,189	100.00	76.36	0.00

## Section VI: Additional Disclosure Information



**Table VI-2: Solvency Test for All PERA Divisions**

**PERA Totals**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)			(1)	(2)	(3)
6/30/2018	\$ 2,593,248,439	\$ 14,936,051,840	\$ 3,784,150,904	\$ 15,252,860,672	100.00%	84.76%	0.00%	
6/30/2017	2,518,111,272	13,970,495,981	3,706,091,037	15,124,167,297	100.00	90.23	0.00	
6/30/2016	2,402,625,960	13,598,504,220	3,473,111,204	14,654,814,373	100.00	90.10	0.00	
6/30/2015	2,372,865,506	12,582,625,481	3,830,995,563	14,074,919,042	100.00	93.00	0.00	
6/30/2014	2,320,509,904	11,954,039,592	3,509,827,190	13,482,815,522	100.00	93.38	0.00	



## Section VI: Additional Disclosure Information

**Table VI-3: Schedule of Retirants Added to and Removed from Rolls by Division  
State General**

Valuation Date	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number Added	Annual Allowances	Number Removed	Annual Allowances	Number	Annual Allowances		
6/30/2018	986	\$35,111,580	427	\$ 9,977,306	18,770	\$528,941,439	4.99%	\$ 28,180
6/30/2017	912	31,124,051	536	11,387,703	18,211	503,807,165	4.08	27,665
6/30/2016	1,105	30,796,909	440	9,067,427	17,835	484,070,817	4.70	27,142
6/30/2015	1,499	32,859,803	418	8,741,632	17,170	462,341,335	5.50	26,927
6/30/2014	1,150	37,217,020	379	7,574,003	16,089	438,223,164	7.26	27,237

### State Police/Corrections

Valuation Date	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number Added	Annual Allowances	Number Removed	Annual Allowances	Number	Annual Allowances		
6/30/2018	62	\$ 2,532,699	31	\$ 992,132	1,553	\$49,873,134	3.19%	\$ 32,114
6/30/2017	51	2,309,111	38	882,314	1,522	48,332,567	3.04	31,756
6/30/2016	65	2,479,773	26	578,925	1,509	46,905,770	4.22	31,084
6/30/2015	108	3,301,453	40	1,047,237	1,470	45,004,922	5.27	30,616
6/30/2014	110	4,049,560	34	937,729	1,402	42,750,706	7.85	30,493



## Section VI: Additional Disclosure Information

### Municipal General

Valuation Date	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number Added	Annual Allowances	Number Removed	Annual Allowances	Number	Annual Allowances		
6/30/2018	911	\$27,278,930	313	\$ 6,346,069	13,515	\$351,020,844	6.34%	\$ 25,973
6/30/2017	717	21,257,836	418	7,607,253	12,917	330,087,983	4.31	25,555
6/30/2016	933	24,135,156	342	6,564,419	12,618	316,437,400	5.88	25,078
6/30/2015	1,066	24,563,648	331	6,177,685	12,027	298,866,663	6.56	24,850
6/30/2014	849	24,476,772	268	4,923,518	11,292	280,480,700	7.49	24,839

### Municipal Police

Valuation Date	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number Added	Annual Allowances	Number Removed	Annual Allowances	Number	Annual Allowances		
6/30/2018	165	\$ 8,523,713	44	\$ 1,491,360	3,598	\$140,615,468	5.26%	\$ 39,082
6/30/2017	166	8,150,488	61	1,633,073	3,477	133,583,115	5.13	38,419
6/30/2016	211	9,918,243	49	1,493,127	3,372	127,065,700	7.10	37,683
6/30/2015	204	8,516,186	37	994,098	3,210	118,640,584	6.77	36,960
6/30/2014	222	10,277,993	34	988,805	3,043	111,118,496	9.12	36,516

### Municipal Fire

Valuation Date	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number Added	Annual Allowances	Number Removed	Annual Allowances	Number	Annual Allowances		
6/30/2018	81	\$ 4,982,102	27	\$ 1,063,296	1,938	\$80,261,994	5.13%	\$ 41,415
6/30/2017	34	2,496,048	22	816,881	1,884	76,343,188	2.25	40,522
6/30/2016	110	5,799,234	33	1,012,932	1,872	74,664,021	6.85	39,885
6/30/2015	93	4,762,883	34	1,134,858	1,795	69,877,719	5.48	38,929
6/30/2014	112	5,738,384	29	946,274	1,736	66,249,694	7.80	38,162



**Table VI-3: Schedule of Retirants Added to and Removed from Rolls for All PERA Divisions**

**PERA Totals**

Valuation Date	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number Added	Annual Allowances	Number Removed	Annual Allowances	Number	Annual Allowances		
6/30/2018	2,205	\$78,429,024	842	\$19,870,163	39,374	\$ 1,150,712,879	5.36%	\$ 29,225
6/30/2017	1,880	65,337,534	1,075	22,327,224	38,011	1,092,154,018	4.10	28,733
6/30/2016	2,424	73,129,315	890	18,716,830	37,206	1,049,143,708	5.47	28,198
6/30/2015	2,970	74,003,973	860	18,095,510	35,672	994,731,223	5.96	27,885
6/30/2014	2,443	81,759,730	744	15,370,329	33,562	938,822,760	7.61	27,973

**Table VI-4: Summary of Actuarial Methods and Assumptions**

<b>Valuation date</b>	June 30, 2018
<b>Actuarial cost method</b>	Entry Age Normal
<b>Amortization method</b>	Level Percent of Payroll, Open
<b>Payroll growth rate</b>	3.00%
<b>Remaining amortization period</b>	30 years
<b>Asset valuation method</b>	4-year Smoothed Market
<b>Actuarial assumptions:</b>	
<b>Investment rate of return*</b>	7.25%
<b>Administrative expenses</b>	0.50% of payroll
<b>Projected salary increases*</b>	3.25% – 13.50%
<b>Post-retirement benefit increases</b>	2.00% compounded annually (2.50% for certain retirees and disabled participants with annual benefits less than \$20,000)

\* Includes inflation at 2.50%



## Appendix A: Additional Membership Data

**Table A-1: Schedule of Active Participant Data as of June 30, 2018 by Division**

### State General

Nearest Age	Completed Years of Service								Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+			
Under 20	25								25	\$ 693,260
20 to 24	505	6							511	15,588,581
25 to 29	1,316	204	6						1,526	55,083,762
30 to 34	1,339	553	269	10					2,171	89,506,840
35 to 39	1,053	573	627	187	13				2,453	111,347,886
40 to 44	850	423	541	482	139	6			2,441	119,145,199
45 to 49	782	452	503	511	441	50	1		2,740	138,951,858
50 to 54	648	387	451	469	375	95	7		2,432	122,863,474
55 to 59	583	390	506	453	384	105	10		2,431	120,741,900
60	107	50	93	96	63	13	1		423	21,087,835
61	79	65	101	76	41	14	5		381	18,896,918
62	71	58	93	68	42	16	2		350	18,390,551
63	62	51	73	55	25	19	6		291	15,924,694
64	53	40	61	22	27	8	2		213	11,040,304
65	38	34	41	31	16	7	3		170	9,478,857
66	30	25	33	24	15	8	7		142	8,175,980
67	24	16	24	14	13	3			94	5,284,928
68	15	17	16	13	8	7	3		79	4,483,161
69	15	14	17	5	5	1	1		58	3,023,253
70	10	7	8	9	7	2			43	2,296,264
71	7	6	6	6	1	2			28	1,725,034
72	10	3	12	2	2	1	1		31	1,853,286
73	2	5	1	1	1	1			11	699,387
74	3	6	2	3	1				15	1,071,579
75	3	4	7	4	1	1	1		21	1,127,713
76	2	2	1	1	1	1			8	546,449
77	4	2	2						8	425,250
78				1	1				2	85,697
79	3			1	1				5	299,697
80 & Over	2	2	1	2	1		3		11	673,595
<b>Total</b>	<b>7,641</b>	<b>3,395</b>	<b>3,495</b>	<b>2,546</b>	<b>1,624</b>	<b>360</b>	<b>53</b>	<b>19,114</b>	<b>\$ 900,513,193</b>	

Average Age: 45.09

Average Service: 9.21





## Appendix A: Additional Membership Data

### State Police/Corrections

Nearest Age	Completed Years of Service							Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+		
Under 20	4							4	\$ 162,618
20 to 24	167	6						173	6,804,104
25 to 29	283	94	16					393	15,830,619
30 to 34	147	100	78	27				352	14,826,655
35 to 39	76	50	60	82	33	1		302	13,615,893
40 to 44	40	25	55	52	64	11		247	12,460,737
45 to 49	28	19	39	38	57	17	1	199	9,996,768
50 to 54	21	10	23	16	31	13	2	116	5,061,274
55 to 59	13	10	19	24	20	3	3	92	3,963,752
60	2	2	3	1	1			9	370,367
61			4	2	6			12	505,998
62	1		1	3		1	1	7	348,983
63		1	1	2	3		1	8	361,055
64		2	2			1	1	6	216,231
65		1						1	36,492
66									
67			1	1	2			4	163,468
68									
69									
70				1	1			2	93,121
71									
72	1							1	27,864
73									
74									
75									
76									
77									
78									
79									
80 & Over									
<b>Total</b>	<b>783</b>	<b>320</b>	<b>302</b>	<b>249</b>	<b>218</b>	<b>47</b>	<b>9</b>	<b>1,928</b>	<b>\$ 84,845,998</b>

Average Age: 36.87

Average Service: 9.62



## Appendix A: Additional Membership Data

### Municipal General

Nearest Age	Completed Years of Service								Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+			
Under 20	329								329	\$ 11,013,307
20 to 24	1,204	7							1,211	38,400,397
25 to 29	1,642	325	21						1,988	65,975,062
30 to 34	1,292	654	364	9					2,319	87,298,577
35 to 39	1,036	588	572	217	12				2,425	99,901,141
40 to 44	915	493	545	327	176	9			2,465	109,727,805
45 to 49	812	510	543	375	405	74	1		2,720	125,391,669
50 to 54	806	437	489	363	339	97	11		2,542	115,908,495
55 to 59	697	478	555	426	363	129	27		2,675	121,613,970
60	132	77	102	57	45	24	8		445	20,045,444
61	107	103	79	70	45	37	8		449	20,562,819
62	110	77	96	56	60	24	10		433	19,790,826
63	69	60	73	35	22	12	3		274	12,715,745
64	58	70	59	30	19	16	4		256	11,657,644
65	49	49	44	30	23	9	2		206	9,199,700
66	37	34	34	25	14	4	2		150	7,053,442
67	36	26	19	16	10	6	3		116	5,056,644
68	31	16	27	6	8	2	1		91	4,145,526
69	29	19	21	11	8	3	1		92	4,235,551
70	34	19	14	6	6	2	3		84	3,489,694
71	23	7	11	2	5	3	1		52	2,168,109
72	13	9	5	4	1	4			36	1,397,495
73	14	8	4	2					28	961,985
74	14	4	6	5	4		1		34	1,234,123
75	8	6	3	1	2		1		21	704,796
76	9	1	1		3				14	317,860
77	5	3	2	1	1				12	447,161
78	6		2		2				10	342,661
79	5			1	1				7	187,817
80 & Over	15	1	4	4	1	1	1		27	672,186
<b>Total</b>	<b>9,537</b>	<b>4,081</b>	<b>3,695</b>	<b>2,079</b>	<b>1,575</b>	<b>456</b>	<b>88</b>		<b>21,511</b>	<b>\$ 901,617,649</b>

Average Age: 44.12

Average Service: 8.36



## Appendix A: Additional Membership Data

### Municipal Police

Nearest Age	Completed Years of Service							Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+		
Under 20									
20 to 24	248	3						251	10,835,735
25 to 29	516	163	6					685	32,707,304
30 to 34	277	267	163	8				715	37,485,848
35 to 39	148	178	276	104	2			708	40,471,511
40 to 44	65	96	137	216	37			551	33,873,407
45 to 49	44	50	89	164	71	5		423	26,391,383
50 to 54	23	32	50	74	38	8		225	13,792,035
55 to 59	9	21	24	40	15	3	1	113	6,853,763
60	2	6	6	5	1			20	1,222,840
61	1	1	1	2	2	1	1	9	604,344
62	1	2	4	5				12	609,392
63	4		3	2				9	480,312
64	1	3	1	4	1	1		11	585,948
65	1				1			2	188,568
66	2	1	2					5	341,646
67		1					1	2	124,726
68	1			1			1	3	187,379
69									
70	1							1	39,986
71		1						1	24,855
72									
73									
74									
75									
76									
77									
78									
79									
80 & Over	1	1						2	77,950
<b>Total</b>	<b>1,345</b>	<b>826</b>	<b>762</b>	<b>625</b>	<b>168</b>	<b>18</b>	<b>4</b>	<b>3,748</b>	<b>\$ 206,898,932</b>

Average Age: 37.14

Average Service: 9.00



## Appendix A: Additional Membership Data

### Municipal Fire

Nearest Age	Completed Years of Service							Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+		
Under 20	6							6	\$ 253,051
20 to 24	120	3						123	4,826,447
25 to 29	238	87	3					328	14,307,408
30 to 34	153	203	99	2				457	22,926,497
35 to 39	74	151	225	73	2			525	29,395,440
40 to 44	32	59	158	131	35			415	25,213,802
45 to 49	18	21	55	94	62	2		252	16,700,499
50 to 54	7	5	34	29	37	8		120	7,845,658
55 to 59	1	3	12	19	16	5	2	58	4,061,784
60			1	1	2			4	306,373
61					1			1	76,341
62	1			3	1	1		6	404,202
63		1	1		1		1	4	264,907
64							1	1	125,480
65				1	1		1	3	212,155
66							1	1	75,325
67									
68									
69	1	1			1			3	114,570
70									
71									
72									
73	1							1	30,811
74									
75									
76									
77									
78				1				1	62,751
79									
80 & Over									
<b>Total</b>	<b>652</b>	<b>534</b>	<b>588</b>	<b>354</b>	<b>159</b>	<b>16</b>	<b>6</b>	<b>2,309</b>	<b>\$ 127,203,502</b>

Average Age: 37.27

Average Service: 9.94



## Appendix A: Additional Membership Data

### All PERA Divisions

Nearest Age	Completed Years of Service								Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+			
Under 20	364							364	\$ 12,122,236	
20 to 24	2,244	25						2,269	76,455,265	
25 to 29	3,995	873	52					4,920	183,904,156	
30 to 34	3,208	1,777	973	56				6,014	252,044,416	
35 to 39	2,387	1,540	1,760	663	62	1		6,413	294,731,870	
40 to 44	1,902	1,096	1,436	1,208	451	26		6,119	300,420,949	
45 to 49	1,684	1,052	1,229	1,182	1,036	148	3	6,334	317,432,177	
50 to 54	1,505	871	1,047	951	820	221	20	5,435	265,470,936	
55 to 59	1,303	902	1,116	962	798	245	43	5,369	257,235,169	
60	243	135	205	160	112	37	9	901	43,032,859	
61	187	169	185	150	95	52	14	852	40,646,420	
62	184	137	194	135	103	42	13	808	39,543,954	
63	135	113	151	94	51	31	11	586	29,746,714	
64	112	115	123	56	47	26	8	487	23,625,607	
65	88	84	85	62	41	16	6	382	19,115,773	
66	69	60	69	49	29	12	10	298	15,646,392	
67	60	43	44	31	25	9	4	216	10,629,766	
68	47	33	43	20	16	9	5	173	8,816,066	
69	45	34	38	16	14	4	2	153	7,373,373	
70	45	26	22	16	14	4	3	130	5,919,065	
71	30	14	17	8	6	5	1	81	3,917,999	
72	24	12	17	6	3	5	1	68	3,278,645	
73	17	13	5	3	1	1		40	1,692,183	
74	17	10	8	8	5		1	49	2,305,702	
75	11	10	10	5	3	1	2	42	1,832,510	
76	11	3	2	1	4	1		22	864,309	
77	9	5	4	1	1			20	872,411	
78	6		2	2	3			13	491,109	
79	8			2	2			12	487,513	
80 & Over	18	4	5	6	2	1	4	40	1,423,731	
<b>Total</b>	<b>19,958</b>	<b>9,156</b>	<b>8,842</b>	<b>5,853</b>	<b>3,744</b>	<b>897</b>	<b>160</b>	<b>48,610</b>	<b>\$ 2,221,079,274</b>	

Average Age: 43.35

Average Service: 8.87



## Appendix A: Additional Membership Data

**Table A-2: Number of Annual Retirement Allowances of Benefit Recipients as of June 30, 2018**

Type of Pension	Number	Total Annual Benefits	Average Annual Pension
<b>Service Retirement Pensions</b>			
Single Life Pension Terminating Upon Death*	15,042	\$ 451,190,431	\$ 29,995
Two Life 100% Survivor Pension			
Retired Member Recipient*	13,214	415,937,183	31,477
Survivor Recipient	2,409	56,816,564	23,585
Two Life 50% Survivor Pension			
Retired Member Recipient*	4,771	157,631,492	33,040
Survivor Recipient	932	12,664,539	13,589
Single Life with Temporary Child Survivor Pension			
Retired Member Recipient*	193	7,919,309	41,033
Child Recipient	7	157,186	22,455
<b>Total Service Retirement Pensions</b>	<b>36,568</b>	<b>\$ 1,102,316,704</b>	<b>\$ 30,144</b>
<b>Disability Retirement Pensions</b>			
Single Life Pension Terminating Upon Death*	464	\$ 8,258,856	\$ 17,799
Two Life 100% Survivor Pension			
Retired Member Recipient*	771	13,408,112	17,391
Survivor Recipient	202	3,168,006	15,683
Two Life 50% Survivor Pension			
Retired Member Recipient*	170	3,280,877	19,299
Survivor Recipient	25	212,726	8,509
Single Life with Temporary Child Survivor Pension			
Retired Member Recipient*	8	123,712	15,464
Child Recipient	1	6,490	6,490
<b>Total Disability Retirement Pensions</b>	<b>1,641</b>	<b>\$ 28,458,779</b>	<b>\$ 17,342</b>
<b>Pre-Retirement Survivor Pensions</b>			
Spouse Recipient	1,122	\$ 19,496,306	17,376
Child Recipient	43	441,090	10,258
<b>Total Pre-Retirement Survivor Pensions</b>	<b>1,165</b>	<b>\$ 19,937,396</b>	<b>\$ 17,114</b>
<b>Total Pensions Being Paid</b>	<b>39,374</b>	<b>\$ 1,150,712,879</b>	<b>\$ 29,225</b>

\* Includes Co-Payees



## Appendix A: Additional Membership Data

**Table A-3: Distribution of Participants Receiving Benefits as of June 30, 2018**

Attained Age	Retired Member		Disabled Member		Survivor Beneficiaries		Totals	
	Number	Annual Pensions	Number	Annual Pensions	Number	Annual Pensions	Number	Annual Pensions
Under 40	13	\$ 234,747	30	461,282	256	\$ 3,919,939	299	\$ 4,615,968
40 to 44	213	8,155,187	69	1,363,989	110	1,810,240	392	11,329,416
45 to 49	1,145	45,608,503	155	3,096,284	164	2,805,175	1,464	51,509,962
50 to 54	2,437	96,443,286	229	4,792,204	225	3,984,844	2,891	105,220,334
55 to 59	3,748	146,138,346	311	6,016,467	348	6,760,367	4,407	158,915,180
60 to 64	5,138	176,160,626	388	6,552,488	475	9,955,929	6,001	192,669,043
65 to 69	7,135	208,017,890	199	2,577,456	590	13,383,483	7,924	223,978,829
70 to 74	6,000	168,662,922	15	109,033	644	13,976,952	6,659	182,748,907
75 to 79	3,660	94,010,826			634	12,716,932	4,294	106,727,758
80 to 84	2,158	54,532,409			553	10,739,101	2,711	65,271,510
85 to 89	1,062	23,745,074			451	8,597,474	1,513	32,342,548
90 to 94	436	9,629,877			224	3,357,074	660	12,986,951
95 to 99	73	1,251,890			57	856,514	130	2,108,404
100 & Over	19	189,187			10	98,882	29	288,069
<b>Total</b>	<b>33,237</b>	<b>\$ 1,032,780,770</b>	<b>1,396</b>	<b>\$ 24,969,203</b>	<b>4,741</b>	<b>\$ 92,962,906</b>	<b>39,374</b>	<b>\$ 1,150,712,879</b>



## Appendix A: Additional Membership Data

**Table A-4: Distribution of Retirees by Years of Service at Retirement  
(not including Disabled Members, Beneficiaries, and Co-Payees)**

Division	Years of Credited Service at Retirement							Total
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	
<b>State General</b>								
Average Monthly Benefit*	\$ 495	\$ 858	\$ 1,455	\$ 2,114	\$ 2,880	\$ 3,392	\$3,364	<b>\$2,529</b>
Number of Retirees*	628	1,760	1,853	1,767	2,301	6,499	619	<b>15,427</b>
<b>State Police/Corrections</b>								
Average Monthly Benefit*	\$ 1,465	\$1,610	\$ 1,626	\$ 2,276	\$ 2,858	\$ 3,406	\$3,913	<b>\$2,954</b>
Number of Retirees*	31	59	63	85	348	528	64	<b>1,178</b>
<b>Municipal General</b>								
Average Monthly Benefit*	\$ 710	\$ 727	\$ 1,230	\$ 1,898	\$ 2,725	\$ 3,259	\$3,447	<b>\$2,360</b>
Number of Retirees*	355	1,267	1,404	1,340	1,619	4,256	410	<b>10,651</b>
<b>Municipal Police</b>								
Average Monthly Benefit*	\$ 2,090	\$1,433	\$ 2,167	\$ 3,277	\$ 3,731	\$ 4,344	\$4,181	<b>\$3,595</b>
Number of Retirees*	36	49	83	450	2,063	155	41	<b>2,877</b>
<b>Municipal Fire</b>								
Average Monthly Benefit*	\$ 2,381	\$2,206	\$ 2,822	\$ 3,427	\$ 3,892	\$ 4,317	\$3,580	<b>\$3,765</b>
Number of Retirees*	10	25	54	212	1,169	60	38	<b>1,568</b>
<b>Totals for All Divisions</b>								
Average Monthly Benefit*	\$ 667	\$ 839	\$ 1,405	\$ 2,251	\$ 3,237	\$ 3,361	\$3,459	<b>\$2,646</b>
Number of Retirees*	1,060	3,160	3,457	3,854	7,500	11,498	1,172	<b>31,701</b>

\* Does not include the following number of retirees with missing years of service at retirement

- State General – 113
- State Police/Corrections – 34
- Municipal General – 134
- Municipal Police – 53
- Municipal Fire – 18





## Appendix A: Additional Membership Data

**Table A-5: Distribution of Recent Retiree Ages at Retirement  
(not including Disabled Members, Beneficiaries, and Co-Payees)**

Division	2013-14 Retirees	2014-15 Retirees	2015-16 Retirees	2016-17 Retirees	2017-18 Retirees	All Current Retirees
<b>State General</b>						
Number	875	772	860	698	753	15,540
Average Monthly Benefit at Retirement	\$ 2,314	\$ 2,264	\$ 2,385	\$ 2,178	\$ 2,412	\$ 2,026
Average Age at Retirement	58.97	60.02	59.77	61.28	60.75	57.60
<b>State Police/Corrections</b>						
Number	70	58	46	28	44	1,212
Average Monthly Benefit at Retirement	\$ 2,863	\$ 2,740	\$ 2,638	\$ 3,063	\$ 2,776	\$ 2,380
Average Age at Retirement	50.65	50.29	51.62	51.44	54.01	51.15
<b>Municipal General</b>						
Number	677	616	691	508	675	10,785
Average Monthly Benefit at Retirement	\$ 2,204	\$ 2,123	\$ 2,114	\$ 1,922	\$ 2,171	\$ 1,942
Average Age at Retirement	59.54	59.97	60.75	61.97	60.65	58.02
<b>Municipal Police</b>						
Number	158	141	163	118	120	2,930
Average Monthly Benefit at Retirement	\$ 3,639	\$ 3,383	\$ 3,697	\$ 3,489	\$ 3,938	\$ 2,917
Average Age at Retirement	48.54	48.92	48.89	49.24	50.50	47.66
<b>Municipal Fire</b>						
Number	86	60	90	18	59	1,586
Average Monthly Benefit at Retirement	\$ 3,844	\$ 4,141	\$ 3,911	\$ 3,570	\$ 4,178	\$ 2,957
Average Age at Retirement	48.94	50.36	49.13	51.16	49.39	47.87
<b>Totals for All Current Retirees</b>						
Number	1,866	1,647	1,850	1,370	1,651	32,053
Average Monthly Benefit at Retirement	\$ 2,478	\$ 2,392	\$ 2,480	\$ 2,232	\$ 2,497	\$ 2,139
Average Age at Retirement	57.52	58.36	58.45	60.17	59.39	56.11



## **Appendix B: Summary of Actuarial Assumptions and Methods**

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### **Actuarial Cost Methods Used for the Valuation**

An actuarial cost method is a procedure for allocating the actuarial present value of benefits and expenses to time periods. The method used for this valuation is known as the individual entry-age actuarial cost method and has the following characteristics:

- (i) The annual normal costs for each individual active member are sufficient to accumulate the value of the member's pension at the time of retirement.
- (ii) Each annual normal cost is a constant percentage of the member's year-by-year projected compensation.

The individual entry-age actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's compensation between the entry-age of the member and the expected exit ages. The expected annual administrative expenses are included in the determination of the actuarially determined contributions.

The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future costs is called the actuarial accrued liability. Deducting actuarial value of assets from the actuarial accrued liability determines the unfunded actuarial accrued liability. Unfunded actuarial accrued liability was amortized as a level percent of payroll over 30 years to determine the actuarial determined contribution. This period is consistent with the policy established by the Retirement Board in October 1996.

Active member payroll was projected to increase 3.00% per year for the purpose of determining the contribution needed to amortize the unfunded actuarial accrued liability. This estimate is consistent with the base rate of increase in salaries used to calculate actuarial present values.

The actuarial value of assets used for funding purposes is derived as follows: prior year actuarial value of assets is increased by contributions and expected investment income and reduced by refunds, benefit payments and expenses. To this amount 25% of the difference between expected and actual investment income for each of the previous four years is added.



## Appendix B: Summary of Actuarial Assumptions and Methods

### Actuarial Assumptions Used for the Valuation (effective with June 30, 2018 Valuation, except as otherwise noted)

**Assumed Rate of Investment Return.** 7.25% per annum net of investment expenses. The administrative expenses are now loaded to the normal cost developed in each annual valuation.

**Administrative Expenses.** 0.50% of payroll.

**Price Inflation.** 2.50% per annum, compounded annually.

**Real Investment Return.** 4.75% over price inflation (4.00% over wage growth). This is the expected rate of return (net of investment expenses) above the rate of price inflation.

**Salary Increases.** Salary increases occur in recognition of (i) individual merit and longevity, (ii) inflation-related depreciation of the purchasing power of salaries, and (iii) other factors such as productivity gains and competition from other employers for personnel. Sample rates follow:

Attributable to:	Annual Rates of Salary Increase for Sample Years of Service				
	1	5	10	15	20
General Increase in Wage Level Due to:					
Inflation	2.50%	2.50%	2.50%	2.50%	2.50%
Other Factors	0.75	0.75	0.75	0.75	0.75
Increase Due to Merit/Longevity:					
State General	5.00	1.25	0.50	0.00	0.00
State Police	10.25	5.75	1.25	1.25	1.25
State Corrections	9.75	3.50	2.00	1.50	1.50
Municipal General*	2.50	1.50	0.50	0.00	0.00
Municipal Police	7.75	2.75	1.50	0.75	0.75
Municipal Fire	7.75	2.75	1.50	1.25	1.25

\* Includes Municipal Detention Officers



## Appendix B: Summary of Actuarial Assumptions and Methods

In the following schedules, State Corrections includes Adult Corrections Officers, Juvenile Corrections Officers and Municipal Detention Officers unless otherwise noted.

**Mortality Assumption.** The mortality assumptions are based on the RPH-2014 Blue Collar mortality table with female ages set forward one year. Future improvement in mortality rates is assumed using 60% of the MP-2017 projection scale generationally. For non-public safety groups, 25% of in-service deaths are assumed to be duty related and 35% are assumed to be duty-related for public safety groups.

Rates are shown for sample ages in the following schedule. Note that sex distinct mortality rates are used solely for determining the funded status and contribution rate adequacy. All benefit amounts are based on merged gender mortality rates.

Sample Mortality Rates (Base Rates)								
Pre-Commencement			Post-Commencement			Post-Commencement		
Age	Male	Female	Age	Male	Female	Age	Male	Female
25	0.000733	0.000244	35	0.001793	0.001169	80	0.053460	0.042932
30	0.000717	0.000317	40	0.002156	0.001611	85	0.088524	0.072752
35	0.000797	0.000417	45	0.003275	0.002671	90	0.146859	0.125111
40	0.000958	0.000598	50	0.005604	0.004235	95	0.223428	0.197901
45	0.001455	0.001013	55	0.007342	0.005165	100	0.313988	0.291040
50	0.002490	0.001685	60	0.009893	0.006890	105	Disabled retirees use the same assumption as healthy lives.	
55	0.004071	0.002510	65	0.014089	0.010092	110		
60	0.006743	0.003606	70	0.021101	0.016038	115		
65	0.011612	0.005456	75	0.032952	0.026199	120		



## Appendix B: Summary of Actuarial Assumptions & Methods

### Rates of Retirement.

**First Eligibility Rates:** These rates are used to measure the probability of members retiring in the first year eligible for retirement at the indicated ages.

Sample Percent Retiring at First Eligibility by Age									
Ages	State General		State Police		State	Municipal General		Municipal	Municipal
	Male	Female	Tier 1	Tier 2	Corrections	Male	Female	Police	Fire
40	25%	25%	25%	40%	40%	20%	25%	30%	30%
45	25	25	25	40	40	20	25	30	25
50	25	25	25	40	40	20	25	30	20
55	25	25	25	40	40	20	25	30	25
60	30	25	50	40	35	15	25	30	20
65	25	25	100	100	35	15	25	30	20
70	25	20			100	20	15	100	100
75	25	20				20	15		
80	100	100				100	100		

**Subsequent Eligibility Rates:** These rates are used to measure the probability of members retiring after the first year eligible for retirement at the indicated ages.

Sample Percent Retiring After First Eligibility by Age*										
Ages	State General		State Police**		State	Municipal General		Municipal Police***		Municipal
	Male	Female	Tier 1	Tier 2	Corrections	Male	Female	Tier 1	Tier 2	Fire
40	25%	25%	35%	20%	20%	20%	25%	35%	40%	30%
45	25	25	35	20	20	20	25	35	40	25
50	25	25	35	20	20	20	25	35	40	20
55	25	25	35	20	20	20	25	35	40	25
60	20	35	50	20	20	15	15	35	30	20
65	30	35	100	100	20	15	10	30	30	20
70	25	20			100	20	15	100	100	100
75	25	20				20	15			
80	100	100				100	100			

\* Rates are 70% at 30 years of service for all ages except State General and Municipal General Tier 2 uses 75% at 36 years of service and Municipal Police Tier 1 uses 75% at 26 years of service.

\*\* Rates for State Police Tier 1 are 45% at 27 years of service, 55% at 28 years of service, and 65% at 29 years of service.

\*\*\* Rates for Municipal Police Tier 1 are 35% at 21 years of service, 40% at 22 years of service, and 45% at 23 years of service, 55% at 24 years of service, and 65% at 25 years of service.

\*\*\* Rates for Municipal Police Tier 2 are 35% at 25 years of service, 40% at 26 years of service, and 45% at 27 years of service, 55% at 28 years of service, and 65% at 29 years of service.



## Appendix B: Summary of Actuarial Assumptions & Methods

**Rates of Withdrawal from Active Membership.** The rates are used to measure probabilities of active members terminating for a reason other than disability or death. The rates do not apply to members who are within the retirement rate range. Assumptions for State General and Municipal General are gender distinct and both based on age and service. Assumptions for all other plans are not gender distinct and are service related only; these rates do not vary by age.

State General Males					
Rates of Active Members Terminating During Year					
Sample Ages	Sample Service (Yr):				
	2	4	6	8	10+
20	18.76%	10.86%	8.21%	7.78%	5.11%
25	17.72	11.06	8.10	7.07	4.65
30	16.45	11.27	7.97	6.18	4.13
35	15.31	10.81	7.59	5.58	3.89
40	14.30	9.97	7.08	5.40	3.86
45	13.55	9.06	6.63	5.40	3.86
50	13.26	8.45	6.49	5.40	3.86
55	13.26	8.37	6.49	5.40	3.86
60	13.26	8.37	6.49	5.40	3.86
65	13.26	8.37			
70	13.26	8.37			

State General Females					
Rates of Active Members Terminating During Year					
Sample Ages	Sample Service (Yr):				
	2	4	6	8	10+
20	18.13%	11.95%	8.22%	6.05%	4.83%
25	17.76	11.95	8.02	5.81	4.25
30	17.28	11.89	7.81	5.54	3.55
35	16.34	11.23	7.45	5.28	3.46
40	15.22	10.24	6.99	5.06	3.46
45	14.19	9.20	6.58	4.95	3.46
50	13.52	8.55	6.45	4.80	3.46
55	13.37	8.50	6.45	4.70	3.46
60	13.37	8.50	6.45	4.70	3.46
65	13.37	8.50			
70	13.37	8.50			



## Appendix B: Summary of Actuarial Assumptions & Methods

### Rates of Withdrawal from Active Membership (cont.)

Municipal General Males					
Rates of Active Members Terminating During Year					
Sample Ages	Sample Service (Yr):				
	2	4	6	8	10+
20	21.70%	14.59%	11.29%	8.93%	8.54%
25	20.00	13.52	10.26	8.05	7.32
30	17.73	12.04	8.96	6.94	5.69
35	15.77	10.65	8.01	6.20	4.61
40	14.06	9.37	7.29	5.73	3.92
45	12.80	8.39	6.87	5.58	3.65
50	12.20	8.01	6.79	5.58	3.65
55	12.18	8.01	6.79	5.58	3.65
60	12.18	8.01	6.79	5.58	3.65
65	12.18	8.01			
70	12.18	8.01			

Municipal General Females					
Rates of Active Members Terminating During Year					
Sample Ages	Sample Service (Yr):				
	2	4	6	8	10+
20	24.40%	17.77%	14.41%	11.94%	7.51%
25	21.96	16.06	12.80	10.32	6.38
30	18.85	13.77	10.63	8.16	4.94
35	16.69	11.96	9.08	6.70	4.09
40	15.16	10.49	7.84	5.74	3.67
45	14.28	9.49	6.50	5.31	3.62
50	14.01	9.14	6.50	5.30	3.62
55	14.01	9.14	6.50	5.30	3.62
60	14.01	9.14	6.50	5.30	3.62
65	14.01	9.14			
70	14.01	9.14			



## Appendix B: Summary of Actuarial Assumptions & Methods

### Rates of Withdrawal from Active Membership (cont.)

Service Based Rates of Active Members Terminating During Year					
All Ages	Sample Service (Yr):				
	1	3	5	7	8+
State Police	8.00%	7.00%	4.00%	4.00%	4.00%
State Corrections	20.00	16.00	9.00	8.00	5.75
Municipal Detention	22.00	16.00	10.00	10.00	6.00
Municipal Police	14.00	9.50	6.80	5.15	3.50
Municipal Fire	10.00	7.50	5.00	3.30	2.75

**Rates of Disability.** The rates are used to measure the probabilities of active members becoming disabled. Rates for sample ages follow. For non-public safety groups, 25% disabilities are assumed to be duty related and 35% are assumed to be duty-related for public safety groups.

Rates Becoming Disabled at Indicated Ages (State Division)					
Sample Ages	State General		State	State	
	Male	Female	Police	Corrections	
25	0.02%	0.02%	0.03%	0.14%	
30	0.04	0.03	0.06	0.16	
35	0.08	0.06	0.08	0.21	
40	0.13	0.12	0.21	0.27	
45	0.24	0.20	0.25	0.46	
50	0.41	0.39	0.41	0.90	
55	0.57	0.61	0.95	1.40	
60	0.74	0.73	1.39	1.88	
65	0.75	0.73	1.39	1.88	

Rates Becoming Disabled at Indicated Ages (Municipal Division)					
Sample Ages	Municipal General		Municipal	Municipal	Municipal
	Male	Female	Detention	Police	Fire
25	0.03%	0.04%	0.06%	0.01%	0.02%
30	0.06	0.04	0.10	0.01	0.02
35	0.09	0.04	0.15	0.05	0.02
40	0.13	0.06	0.22	0.11	0.08
45	0.18	0.14	0.32	0.18	0.08
50	0.30	0.25	0.51	0.28	0.33
55	0.49	0.39	0.85	0.46	0.33
60	0.60	0.51	1.04	0.74	1.17
65	0.62	0.59	1.07	1.08	1.17





## Appendix B: Summary of Actuarial Assumptions & Methods

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### Miscellaneous and Technical Assumptions

<b>Marriage Assumption:</b>	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses. It is assumed that spouses have no eligible children for purposes of death-in-service benefits.
<b>Pay Increase Timing:</b>	Beginning of plan year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
<b>Decrement Timing:</b>	All decrements are assumed to occur at the beginning of the plan year.
<b>Eligibility Testing:</b>	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
<b>Decrement Relativity:</b>	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
<b>Decrement Operation:</b>	Neither disability nor withdrawal decrements operate during retirement eligibility.
<b>Loads:</b>	Retiree liabilities were increased by 1% to account for the pop-up provision.
<b>Incidence of Contributions:</b>	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.
<b>Benefit Service:</b>	Exact fractional service is used to determine the amount of benefit payable.
<b>Data Changes:</b>	For missing dates of birth for active members, we assumed to enter the system at the average entry age. For retiree records with a joint and survivor option and a missing beneficiary date of birth, the beneficiary was assumed to be 3 years younger if the member was male and 3 years older if the member was female.



## Appendix B: Summary of Actuarial Assumptions & Methods

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### Definitions of Technical Terms

***Actuarial Accrued Liability.*** The difference between the actuarial present value of future benefits payments and the actuarial present value of future normal costs.

***Actuarial Cost Method.*** A mathematical procedure for allocating the dollar amount of the “actuarial present value of future benefit payments” between future normal cost and actuarial accrued liability.

***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 payment.

***Amortization.*** Paying off an interest-discounted amount with periodic payments of interest and principal – as opposed to paying off with a lump sum payment.

***Experience Gain (Loss).*** The difference between actual actuarial costs and anticipated actuarial costs – during the period between two valuation dates.

***Normal Cost.*** The actuarial cost allocated to the current year by the actuarial cost method.

***Unfunded Actuarial Accrued Liability.*** The difference between the actuarial accrued liability and the actuarial value of assets. Sometimes referred to as “unfunded accrued liability.”



## **Appendix C: Summary of Plan Provisions**

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### **Benefit Tier**

Effective July 1, 2013, Senate Bill 27 establishes two tiers of benefits under each PERA coverage plan:

#### **Tier 1**

- Current active members employed by a PERA affiliate on June 30, 2013
- Inactive members who did not receive a refund and have employee contributions on account on June 30, 2013
- Currently retired or will retire on or before June 30, 2013

*Note: State and Municipal General members hired between July 1, 2010 and June 30, 2013 are grandfathered into Tier 1 coverage plans.*

#### **Tier 2**

- Active members first hired on or after July 1, 2013
- Members who received a refund of employee contributions on or before June 30, 2013 and return to work for a PERA affiliate on or after July 1, 2013

### **Normal Retirement Eligibility Conditions**

#### **Tier 1**

Applicable to all members:

- Any age with 25 or more years of credited service; or
- Age 60 or older with 20 or more years of credited service; or
- Age 61 or older with 17 or more years of credited service; or
- Age 62 or older with 14 or more years of credited service; or
- Age 63 or older with 11 or more years of credited services or
- Age 64 or older with 8 or more years of credited service; or
- Age 65 or older with 5 or more years of credited service.

Applicable to Municipal Police (Plans 3, 4, & 5) and Municipal Fire (Plans 3, 4, & 5) members:

- Any age with 20 or more years of credited service



## **Appendix C: Summary of Plan Provisions**

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### **Normal Retirement Eligibility Conditions (cont.)**

#### **Tier 2**

Applicable to State General and Municipal General (Plan 1-4) members:

- Age 65 or older with 8 or more years of credited service; or
- Any age if the sum of the member's age and years of credited service equals at least 85, provided member has at least 8 years of credited service.

Applicable to State Police Officers, Adult Correctional Officers, Peace Officers, Juvenile Correctional Officers, Municipal Police, Municipal Fire, and Municipal Detention Officers:

- Age 60 or older with 6 or more years of credited service; or
- Any age with 25 or more years of credited service

### **Normal Retirement Pension Amount**

The amount of normal retirement pension is based on:

- Final average salary:
  - For Tier 1 members, the average of salary for the 36 consecutive months of credited service producing the largest average;
  - For Tier 2 members, the average of salary for the 60 consecutive months of credited service producing the largest average;
- Credited service (years and months); and the
- Coverage plan.



## Appendix C: Summary of Plan Provisions

The pension accrual factor and maximum pension, as a percent of final average salary, under each coverage plan are shown below:

Coverage Plan	Pension Factor Per Year of Credited Service		Maximum Pension as Percent of Final Average Salary
	Tier 1	Tier 2	Tier 1 & Tier 2
State General Member Coverage Plan 3	3.0%	2.5%	90%
Peace Officers Coverage Plan 3	3.0	3.0	90
State Police and Adult Corrections Officers Member Coverage Plan 1	3.0	3.0	90
Hazardous Duty (Juvenile Corrections Officer) Coverage Plan 2	3.0	3.0	90
Municipal General Member Coverage Plan 1	2.0	2.0	90
Municipal General Member Coverage Plan 2	2.5	2.0	90
Municipal General Member Coverage Plan 3	3.0	2.5	90
Municipal General Member Coverage Plan 4	3.0	2.5	90
Municipal Detention Officer Coverage Plan 1	3.0	3.0	90
Municipal Police Member Coverage Plan 1	2.0	2.0	90
Municipal Police Member Coverage Plan 2	2.5	2.0	90
Municipal Police Member Coverage Plan 3	2.5	2.0	90
Municipal Police Member Coverage Plan 4	3.0	2.5	90
Municipal Police Member Coverage Plan 5	3.5	3.0	90
Municipal Fire Member Coverage Plan 1	2.0	2.0	90
Municipal Fire Member Coverage Plan 2	2.5	2.0	90
Municipal Fire Member Coverage Plan 3	2.5	2.0	90
Municipal Fire Member Coverage Plan 4	3.0	2.5	90
Municipal Fire Member Coverage Plan 5	3.5	3.0	90



## **Appendix C: Summary of Plan Provisions**

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### **Vested Termination of Membership (Employment)**

Termination of employment and membership with at least 5 years of credited service for Tier 1 members. For Tier 2 State General and Municipal General (Non-Public Safety) members, vesting is 8 years. Tier 2 Public Safety members (State Police Officers, Adult Correctional Officers, Peace Officers, Juvenile Correctional Officers, Municipal Police, Fire, Detention Officers) are vested with at least 6 years of credited service. Accumulated member contributions must be left on deposit. Payment of the pension is available upon eligibility for normal retirement. In addition, certain disability and survivor pension provisions apply.

### **Normal and Optional Forms of Payment**

The normal form of payment is for life. Optional contingent survivor beneficiary forms of payment are available on an actuarial equivalent basis. Total pension payments can never be less than the member's accumulated contributions.

### **Survivor Pensions – Death in the Line of Duty**

Pensions are paid to the eligible spouse and eligible children if survivor coverage has not been elected under the Elective Survivor Pension Beneficiary provision. The amount of pension payable for life to an eligible spouse is the greater of 1) 50% of final average salary or 2) the accrued normal retirement pension reduced for option B election. The amount of pension payable to each eligible child is an equal share of 25% of final average salary. If there is not an eligible spouse or the eligible spouse dies, and if there are 2 or more eligible children, the amount of pension payable to each eligible child is an equal share of 50% of final average salary. An eligible child is an unmarried natural or adopted child who is under age 18. A child's pension terminates upon death, marriage or reaching age 18. The pension of any remaining eligible children is recalculated whenever a child's pension is terminated.



## **Appendix C: Summary of Plan Provisions**

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### **Survivor Pensions – Death Not in the Line of Duty**

Requires 5 years of credited service for Tier 1 members, 6 years for Tier 2 Public Safety, and 8 years for Tier 2 Non-Public Safety. Benefit applies to members and vested former members who have not elected coverage under the Elective Survivor Pension Beneficiary provision. Pensions are paid to an eligible spouse OR eligible children. The amount of pension payable for the life of an eligible spouse is the greater of 1) 30% of final average salary or 2) accrued normal retirement pension reduced for option B election. An eligible child pension is paid if there is not an eligible spouse or following the death of an eligible spouse. The pension is payable to each child in equal shares. An eligible child is an unmarried natural or adopted child who is under age 18. A child's pension terminates upon death, marriage or reaching age 18. The pension of any remaining eligible children is recalculated whenever a child's pension is terminated.

### **Elective Survivor Beneficiary Pension**

Applicable to Tier 1 members with 5 years of credited service, Tier 2 Public Safety with 6 years, and Tier 2 Non-Public Safety with 8 years. Also applicable to vested former members who have elected option B and designated a survivor pension beneficiary who has an insurable interest. The amount of pension is the amount of accrued normal retirement pension under optional form of payment B (100% continuation to beneficiary).

### **Disability Retirement**

Applicable to Tier 1 members with 5 years of credited service, Tier 2 Public Safety with 6 years, and Tier 2 Non-Public Safety with 8 years. Also applicable to vested former members. The credited service requirement is waived if the disability is incurred in line of duty. The amount of disability pension is the accrued normal retirement pension at time of disability retirement. If the disability is in line of duty, the credited service used is the amount that would have been acquired when first eligible for normal retirement.



## **Appendix C: Summary of Plan Provisions**

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### **Cost-of-Living Increases**

For Tier 1 Members, pensions are increased each July 1 by 2% subject to the following eligibility periods:

- If member retires prior to July 1, 2014, Cost-of-Living Adjustment (COLA) is payable after retirement has been in effect for at least 2 full calendar years.
- If member retires on or after July 1, 2014 but prior to July 1, 2015, COLA is payable after retirement has been in effect for at least 3 full calendar years.
- If member retires on or after July 1, 2015 but prior to July 1, 2016, COLA is payable after retirement has been in effect for at least 4 full calendar years.
- If member retires on or after July 1, 2016, COLA is payable after retirement has been in effect for at least 7 full calendar years.
- If retired on account of disability or if at least age 65, the waiting period is reduced to 1 full calendar year.

For Tier 2 Members, pensions are increased each July 1 by 2% subject to the following eligibility periods:

- COLA is payable after retirement has been in effect for at least 7 full calendar years.
- If retired on account of disability or if at least age 65, the waiting period is reduced to 1 full calendar year.

For certain Tier 1 and Tier 2 retirees, pensions are increased each July 1 by 2.5% subject the eligibility periods listed above, provided the conditions below are met:

- Retirees who retired with at least 25 years of service and whose annual pension is \$20,000 or less.
- Disabled retirees whose annual pension is \$20,000 or less.

### **Service Credit**

Tier 1 Members in the State Police and Adult Corrections Officers Coverage Plan and members in the Municipal Detention Officers Coverage Plan receive 1.2 years of credited service for each year of service rendered. All other members receive 1.0 year of credited service for each year of service rendered.





## Appendix C: Summary of Plan Provisions

### Contributions by Members and Employers

Contributions by members and affiliated public employers are at the following rates shown below.

Coverage Plan	Percent of Salary Member*	Contribution Rate Employer
State General Member Coverage Plan 3	8.92%	16.99%
State Police Member and Adult Correctional Officer Member Coverage Plan 1	9.10	25.50
Hazardous Duty (Juvenile Corrections) Member Coverage Plan 2	6.28	26.12
Municipal General Member Coverage Plan 1	8.50	7.40
Municipal General Member Coverage Plan 2	10.65	9.55
Municipal General Member Coverage Plan 3	14.65	9.55
Municipal General Member Coverage Plan 4	17.15	12.05
Municipal Detention Officer Member Coverage Plan 1	18.15	17.05
Municipal Police Member Coverage Plan 1	8.50	10.40
Municipal Police Member Coverage Plan 2	8.50	15.40
Municipal Police Member Coverage Plan 3	8.50	18.90
Municipal Police Member Coverage Plan 4	13.85	18.90
Municipal Police Member Coverage Plan 5	17.80	18.90
Municipal Fire Member Coverage Plan 1	9.50	11.40
Municipal Fire Member Coverage Plan 2	9.50	17.90
Municipal Fire Member Coverage Plan 3	9.50	21.65
Municipal Fire Member Coverage Plan 4	14.30	21.65
Municipal Fire Member Coverage Plan 5	17.70	21.65

Interest is credited to member contributions on each June 30 at the rates set annually by the Retirement Board. Effective July 1, 2012, the interest crediting rate for member contributions is 2%.

\* For employees whose annual salary is \$20,000 or less, the employee contribution rates shown above are reduced by 1.5%