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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, 2015**





Cavanaugh Macdonald

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The experience and dedication you deserve

October 29, 2015

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, 2015; 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, 2015 and ending June 30, 2016 (FY 2016). 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.

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 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,

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

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



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Section I: Board Summary

The table below summarizes the results of the June 30, 2015 actuarial valuation as compared with the prior year.

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

Valuation Date	June 30, 2015	June 30, 2014
Total Annual Payroll	\$ 2,248,254,276	\$ 2,102,265,325
Total Valuation Payroll	\$ 2,326,943,176	\$ 2,175,844,611
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 6,549,111,175	\$ 6,166,509,262
Retired Members and Survivors	<u>12,237,375,375</u>	<u>11,617,867,424</u>
Total	\$ 18,786,486,550	\$ 17,784,376,686
Actuarial Value of Assets	\$ 14,074,919,042	\$ 13,482,815,522
Funded Ratio	74.9 %	75.8 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 4,711,567,508	\$ 4,301,561,164
Calculation of Required Contribution		
Statutory Contribution Rate		
Employer Contribution Rate	15.08 %	15.04 %
Member Contribution Rate	<u>12.02 %</u>	<u>12.05 %</u>
Total	27.10 %	27.09 %
Less Normal Cost:		
Retirement	11.42 %	11.59 %
Termination	3.90 %	3.79 %
Pre-Retirement Survivors	0.48 %	0.50 %
Disability	<u>0.78 %</u>	<u>0.79 %</u>
Total Normal Cost	16.58 %	16.67 %
Less Administrative Expenses	0.45 %	0.45 %
Amount Remaining to Amortize UAAL	10.07 %	9.97 %
Amortization Period	41 years	40 years
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	1.76 %	1.58 %



Section I: Board Summary

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.

- The total PERA Fund experienced an investment return of approximately \$251.5 million 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 7.64% compared to an expected return of 7.75%. As of June 30, 2015, the actuarial value of assets is 99% of market value. Table III-4 provides the development of the actuarial value of assets.
- The total actuarial loss due to the investment experience of the total PERA Fund is \$14.9 million. The loss on non-investment related items totaled \$286.5 million. The net loss due to the plan’s experience was \$301.4 million.
- The total increase to the UAAL of PERA is \$410.0 million and results in a decrease to the funded ratio from 75.8% to 74.9%.
- Based on the current statutory rates and actuarial assumptions, the UAAL is projected to be fully amortized in 41 years.

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, 2015	June 30, 2014
Total Annual Payroll	\$ 938,168,776	\$ 863,797,166
Total Valuation Payroll	\$ 971,004,683	\$ 894,030,067
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 2,759,790,183	\$ 2,592,459,108
Retired Members and Survivors	<u>5,441,215,570</u>	<u>5,193,531,789</u>
Total	\$ 8,201,005,753	\$ 7,785,990,897
Actuarial Value of Assets	\$ 5,549,137,149	\$ 5,334,025,804
Funded Ratio	67.7 %	68.5 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 2,651,868,604	\$ 2,451,965,093
Calculation of Required Contribution		
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	10.50 %	10.73 %
Termination	3.73 %	3.66 %
Pre-Retirement Survivors	0.45 %	0.49 %
Disability	<u>0.86 %</u>	<u>0.87 %</u>
Total Normal Cost	15.54 %	15.75 %
Less Administrative Expenses	0.45 %	0.45 %
Amount Remaining to Amortize UAAL	9.92 %	9.71 %
Amortization Period	Infinite	Infinite
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	6.03 %	6.31 %



Section I: Board Summary

Summary of Key Findings – State General Division

The UAAL increased from \$2.45 billion to \$2.65 billion. Lower normal costs due to a greater proportion of Tier 2 employees contributed to a 0.28% of payroll decrease to the annual amount necessary to amortize the UAAL over a 30-year period. The funded ratio decreased from 68.5% to 67.7%. 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 \$113.3 million during the plan year ended June 30, 2015. The non-investment related loss of \$139.5 million is primarily due to larger than expected salary increases. These losses are offset by a \$26.2 million gain due to investment related experience. Table IV-4 provides the detailed information on the sources and magnitude of actuarial gains and losses.
- The financing period for the unfunded liability based upon the statutory contribution rates is an infinite period for the seventh consecutive year.



Section I: Board Summary

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

Valuation Date	June 30, 2015	June 30, 2014
Total Annual Payroll	\$ 97,352,917	\$ 91,551,934
Total Valuation Payroll	\$ 100,760,269	\$ 94,756,252
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 301,393,813	\$ 286,704,115
Retired Members and Survivors	<u>589,740,952</u>	<u>563,218,677</u>
Total	\$ 891,134,765	\$ 849,922,792
Actuarial Value of Assets	\$1,075,204,637	\$1,016,533,008
Funded Ratio	120.7 %	119.6 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ (184,069,872)	\$ (166,610,216)
Calculation of Required Contribution		
Statutory Contribution Rate		
Employer Contribution Rate	25.58 %	25.59 %
Member Contribution Rate	<u>8.72 %</u>	<u>8.71 %</u>
Total	34.30 %	34.30 %
Less Normal Cost:		
Retirement	15.33 %	15.57 %
Termination	3.61 %	3.60 %
Pre-Retirement Survivors	0.45 %	0.46 %
Disability	<u>1.48 %</u>	<u>1.50 %</u>
Total Normal Cost	20.87 %	21.13 %
Less Administrative Expenses	0.45 %	0.45 %
Amount Remaining to Amortize UAAL	12.98 %	12.72 %
Amortization Period	0	0
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	N/A	N/A



Section I: Board Summary

Summary of Key Findings – State Police/Corrections Division

As of June 30, 2015, the actuarial value of assets exceeded accrued liabilities by \$184.1 million. As of June 30, 2014, the accrued liabilities exceeded the actuarial value of assets by \$166.6 million. This represents a decrease in the UAAL of \$17.5 million from the previous year. The normal cost rate decreased from 21.13% to 20.87% as more Tier 2 employees were hired. The funded ratio increased from 119.6% to 120.7%. 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 \$2.8 million during the plan year ended June 30, 2015.
- The actuarial loss is comprised of a \$1.1 million investment related loss and a \$1.7 million loss due to non-investment related experience which was primarily due to salary losses. Table IV-4 provides the detailed information on the sources and magnitude of actuarial gains and losses.



Section I: Board Summary

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

Valuation Date	June 30, 2015	June 30, 2014
Total Annual Payroll	\$ 857,243,239	\$ 814,827,128
Total Valuation Payroll	\$ 887,246,752	\$ 843,346,077
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 2,222,277,828	\$ 2,103,396,604
Retired Members and Survivors	<u>3,637,317,927</u>	<u>3,433,780,808</u>
Total	\$ 5,859,595,755	\$ 5,537,177,412
Actuarial Value of Assets	\$ 4,696,871,223	\$ 4,515,120,417
Funded Ratio	80.2 %	81.5 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 1,162,724,532	\$ 1,022,056,995
Calculation of Required Contribution		
Statutory Contribution Rate		
Employer Contribution Rate	9.86 %	9.87 %
Member Contribution Rate	<u>13.56 %</u>	<u>13.59 %</u>
Total	23.42 %	23.46 %
Less Normal Cost:		
Retirement	8.69 %	8.76 %
Termination	4.31 %	4.14 %
Pre-Retirement Survivors	0.51 %	0.51 %
Disability	<u>0.69 %</u>	<u>0.69 %</u>
Total Normal Cost	14.20 %	14.10 %
Less Administrative Expenses	0.45 %	0.45 %
Amount Remaining to Amortize UAAL	8.77 %	8.91 %
Amortization Period	24 years	20 years
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	N/A	N/A



Section I: Board Summary

Summary of Key Findings – Municipal General Division

The UAAL increased from \$1.02 billion to \$1.16 billion. The current statutory rate will amortize the UAAL over a 24-year period and exceeds the minimum required contribution. The funded ratio decreased from 81.5% to 80.2%. 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 General Division experienced a net actuarial loss of \$136.8 million and a 1.3% decrease to the funded ratio during the plan year ended June 30, 2015. The liability loss of \$91.1 million is primarily comprised of a \$70.3 million loss due to larger than expected salary increases. There was a \$45.7 million loss due to investment related experience.
- These losses contributed to an increase in the amortization period from 20 to 24 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, 2015	June 30, 2014
Total Annual Payroll	\$ 222,085,818	\$ 209,092,483
Total Valuation Payroll	\$ 229,858,822	\$ 216,410,720
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 764,622,849	\$ 723,213,906
Retired Members and Survivors	<u>1,637,758,091</u>	<u>1,540,350,902</u>
Total	\$ 2,402,380,940	\$ 2,263,564,808
Actuarial Value of Assets	\$ 1,865,190,859	\$ 1,772,210,104
Funded Ratio	77.6 %	78.3 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 537,190,081	\$ 491,354,704
Calculation of Required Contribution		
Statutory Contribution Rate		
Employer Contribution Rate	18.69 %	18.65 %
Member Contribution Rate	<u>17.27 %</u>	<u>17.23 %</u>
Total	35.96 %	35.88 %
Less Normal Cost:		
Retirement	17.69 %	18.10 %
Termination	3.77 %	3.62 %
Pre-Retirement Survivors	0.46 %	0.46 %
Disability	<u>0.75 %</u>	<u>0.76 %</u>
Total Normal Cost	22.67 %	22.94 %
Less Administrative Expenses	0.45 %	0.45 %
Amount Remaining to Amortize UAAL	12.84 %	12.49 %
Amortization Period	32 years	32 years
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	0.81 %	0.77 %



Section I: Board Summary

Summary of Key Findings – Municipal Police Division

The UAAL increased from \$491.4 million to \$537.2 million. The funded ratio decreased from 78.3% to 77.6%. 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 \$33.3 million and a 0.7% decrease to the funded ratio during the plan year ended June 30, 2015. The gain is comprised of a \$2.9 million investment related gain which is offset by a \$30.4 million loss due to non-investment related experience which was primarily due to salary losses. Table IV-5 provides the detailed information on the sources and magnitude of actuarial gains and losses.
- The financing period for the unfunded liability based upon the statutory contribution rates is 32 years, and remains unchanged from the prior valuation for the plan year ended June 30, 2014.



Section I: Board Summary

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

Valuation Date	June 30, 2015	June 30, 2014
Total Annual Payroll	\$ 133,403,526	\$ 122,996,614
Total Valuation Payroll	\$ 138,072,649	\$ 127,301,495
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	\$ 501,026,502	\$ 460,735,529
Retired Members and Survivors	<u>931,342,835</u>	<u>886,985,248</u>
Total	\$ 1,432,369,337	\$ 1,347,720,777
Actuarial Value of Assets	\$ 888,515,174	\$ 844,926,189
Funded Ratio	62.0 %	62.7 %
Unfunded Actuarial Accrued Liability (UAAL) (AAL - Actuarial Value of Assets)	\$ 543,854,163	\$ 502,794,588
Calculation of Required Contribution		
Statutory Contribution Rate		
Employer Contribution Rate	21.58 %	21.56 %
Member Contribution Rate	<u>17.58 %</u>	<u>17.58 %</u>
Total	39.16 %	39.14 %
Less Normal Cost:		
Retirement	21.99 %	22.38 %
Termination	2.93 %	2.84 %
Pre-Retirement Survivors	0.51 %	0.51 %
Disability	<u>0.43 %</u>	<u>0.44 %</u>
Total Normal Cost	25.86 %	26.17 %
Less Administrative Expenses	0.45 %	0.45 %
Amount Remaining to Amortize UAAL	12.85 %	12.52 %
Amortization Period	Infinite	Infinite
Increase in Statutory Rate Necessary to Amortize UAAL over 30 Years	10.16 %	10.55 %



Section I: Board Summary

Summary of Key Findings – Municipal Fire Division

The UAAL increased from \$502.8 million to \$543.9 million and the funded ratio decreased from 62.7% to 62.0%. 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 \$15.2 million. The loss is comprised of a \$2.8 million investment related gain which is offset by an \$18.0 million loss due to non-investment related experience which was primarily due to greater than expected salary increases. Table IV-5 provides the detailed information on the sources and magnitude of actuarial gains and losses.
- The financing period for the unfunded liability based upon the statutory contribution rates is an infinite period for the seventh 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, 2015.

Table II-1: Summary of Membership Data as of June 30, 2015

Group	Count					Totals
	State General	State Police/ Corrections	Municipal General	Municipal Police	Municipal Fire	
Total Active Members	20,253	1,880	21,217	3,647	2,176	49,173
Inactive Members						
Deferred Vested	2,753	121	1,857	198	87	5,016
Other	2,365	269	3,615	266	103	6,618
Total Inactive Members	5,118	390	5,472	464	190	11,634
Retirees						
Service*	14,537	1,246	9,915	2,874	1,611	30,183
Disabled	604	38	443	46	11	1,142
Beneficiaries	2,029	186	1,669	290	173	4,347
Total Retirees	17,170	1,470	12,027	3,210	1,795	35,672
Totals	42,541	3,740	38,716	7,321	4,161	96,479

* Counts include Co-Payees as follows:

State General - 289

State Police – 83

Municipal General - 284

Municipal Police - 229

Municipal Fire - 137



Section II: Membership Data

Table II-2: Summary of Active Membership Valuation Data

Division	Number		Total Payroll		Average Salary	
	2015	2014	2015	2014	2015	2014
State Division						
General	20,253	20,015	\$ 938,168,776	\$ 863,797,166	\$46,322	\$43,157
Police	514	498	34,298,253	29,495,134	66,728	59,227
Adult Corrections	1,062	1,123	49,929,558	49,323,098	47,015	43,921
Juvenile Corrections	304	330	13,125,106	12,733,702	43,175	38,587
Total State Division	22,133	21,966	\$1,035,521,693	\$ 955,349,100	\$46,786	\$43,492
Municipal Division						
General Coverage Plans						
Plan 1	806	834	\$ 26,407,142	\$ 26,248,640	\$32,763	\$31,473
Plan 2	6,389	6,316	238,295,951	221,652,325	37,298	35,094
Plan 3	12,578	12,885	531,884,810	507,644,587	42,287	39,398
Plan 4	756	726	27,226,264	25,066,641	36,014	34,527
Detention Officers Plan 1	688	719	33,429,072	34,214,935	48,589	47,587
Total General	21,217	21,480	\$ 857,243,239	\$ 814,827,128	\$40,404	\$37,934
Police Coverage Plans						
Plan 1	107	121	\$ 4,685,825	\$ 5,274,854	\$43,793	\$43,594
Plan 2	55	49	2,185,679	1,973,342	39,740	40,272
Plan 3	68	71	3,199,971	3,134,545	47,058	44,149
Plan 4	134	122	6,282,101	5,495,745	46,881	45,047
Plan 5	3,283	3,322	205,732,242	193,213,997	62,666	58,162
Total Police	3,647	3,685	\$ 222,085,818	\$ 209,092,483	\$60,895	\$56,742
Fire Coverage Plans						
Plan 1	17	24	\$ 683,059	\$ 863,396	\$40,180	\$35,975
Plan 2	18	11	765,257	481,600	42,514	43,782
Plan 3	5	4	229,702	162,129	45,940	40,532
Plan 4	16	11	779,673	532,525	48,730	48,411
Plan 5	2,120	2,107	130,945,835	120,956,964	61,767	57,407
Total Fire	2,176	2,157	\$ 133,403,526	\$ 122,996,614	\$61,307	\$57,022
Total Municipal Division	27,040	27,322	\$1,212,732,583	\$1,146,916,225	\$44,850	\$41,978
Total PERA	49,173	49,288	\$2,248,254,276	\$2,102,265,325	\$45,721	\$42,653



Section II: Membership Data

Table II-3: Summary of Deferred Vested Members as of June 30, 2015

Division	Number	Average Age	Average Service	Average Annual Benefit
State Division				
General	2,753	51.70	9.08	\$ 11,696
Police/Hazardous Duty	<u>121</u>	48.80	9.55	10,063
Total State Division	2,874	51.57	9.10	\$ 11,628
Municipal Division				
General	1,857	52.11	9.17	\$ 9,462
Police	198	45.48	8.96	12,302
Fire	<u>87</u>	42.99	7.34	10,470
Total Municipal Division	2,142	51.13	9.08	\$ 9,766
PERA Totals	5,016	51.39	9.09	\$ 10,832



Section II: Membership Data

Table II-4: Summary of Retirees and Survivors as of June 30, 2015

Type of Retirement	Division					Total
	State General	State Police/ Corrections	Municipal General	Municipal Police	Municipal Fire	
Service						
Number	14,537	1,246	9,915	2,874	1,611	30,183
Total Annual Benefits	\$417,562,202	\$ 40,277,461	\$265,033,362	\$110,531,195	\$64,442,502	\$897,846,722
Avg Annual Benefit	\$ 28,724	\$ 32,325	\$ 26,731	\$ 38,459	\$ 40,002	\$ 29,747
Avg Age	68.66	62.19	67.78	59.06	60.83	66.77
Disability						
Number	604	38	443	46	11	1,142
Total Annual Benefits	\$ 9,989,756	\$ 606,728	\$ 7,000,043	\$ 1,081,006	\$ 285,118	\$ 18,962,651
Avg Annual Benefit	\$ 16,539	\$ 15,967	\$ 15,801	\$ 23,500	\$ 25,920	\$ 16,605
Avg Age	56.52	56.79	55.46	49.04	53.72	55.79
Survivors						
Number	2,029	186	1,669	290	173	4,347
Total Annual Benefits	\$ 34,789,377	\$ 4,120,733	\$ 26,833,258	\$ 7,028,383	\$ 5,150,099	\$ 77,921,850
Avg Annual Benefit	\$ 17,146	\$ 22,154	\$ 16,077	\$ 24,236	\$ 29,769	\$ 17,925
Avg Age	69.76	64.65	69.14	65.09	70.44	69.02
Total						
Number	17,170	1,470	12,027	3,210	1,795	35,672
Total Annual Benefits	\$462,341,335	\$ 45,004,922	\$298,866,663	\$118,640,584	\$69,877,719	\$994,731,223
Avg Annual Benefit	\$ 26,927	\$ 30,616	\$ 24,850	\$ 36,960	\$ 38,929	\$ 27,885
Avg Age	68.36	62.36	67.51	59.46	61.71	66.69



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
State General Division				
6/30/2015	20,253	\$ 938,168,776	\$ 46,322	7.33 %
6/30/2014	20,015	863,797,166	43,157	3.17 %
6/30/2013	19,980	835,817,618	41,833	0.57 %
6/30/2012	19,325	803,873,875	41,598	(0.31)%
6/30/2011	19,614	818,428,532	41,727	0.53 %
State Police/Corrections Division				
6/30/2015	1,880	\$ 97,352,917	\$ 51,783	10.35 %
6/30/2014	1,951	91,551,934	46,926	1.73 %
6/30/2013	1,956	90,225,253	46,127	1.43 %
6/30/2012	1,916	87,137,037	45,479	2.13 %
6/30/2011	1,881	83,759,230	44,529	1.50 %
Municipal General Division				
6/30/2015	21,217	\$ 857,243,239	\$ 40,404	6.51 %
6/30/2014	21,480	814,827,128	37,934	4.46 %
6/30/2013	22,123	803,398,205	36,315	(1.66)%
6/30/2012	21,434	791,529,406	36,929	4.56 %
6/30/2011	20,848	736,339,828	35,319	(2.70)%
Municipal Police Division				
6/30/2015	3,647	\$ 222,085,818	\$ 60,895	7.32 %
6/30/2014	3,685	209,092,483	56,742	5.42 %
6/30/2013	3,744	201,525,064	53,826	0.28 %
6/30/2012	3,660	196,453,568	53,676	2.86 %
6/30/2011	3,603	188,010,463	52,182	0.45 %
Municipal Fire Division				
6/30/2015	2,176	\$ 133,403,526	\$ 61,307	7.51 %
6/30/2014	2,157	122,996,614	57,022	6.05 %
6/30/2013	2,209	118,771,370	53,767	0.18 %
6/30/2012	2,148	115,286,221	53,671	4.45 %
6/30/2011	2,111	108,475,708	51,386	(0.32)%

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
6/30/2015	49,173	\$ 2,248,254,276	\$ 45,721	7.19 %
6/30/2014	49,288	2,102,265,325	42,653	4.07 %
6/30/2013	50,012	2,049,737,510	40,985	(0.36)%
6/30/2012	48,483	1,994,280,107	41,134	2.16 %
6/30/2011	48,057	1,935,013,761	40,265	(0.83)%



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, 2015.

Table III-1: Market Value Summary as of June 30, 2015

Division	June 30, 2015	June 30, 2014
State General	\$ 5,605,660,155	\$ 5,694,052,027
State Police/Corrections	1,086,156,574	1,085,145,076
Municipal General	4,744,713,126	4,819,873,677
Municipal Police	1,884,189,523	1,891,827,469
Municipal Fire	897,565,509	901,955,457
Total Market Value of Assets	\$ 14,218,284,887	\$ 14,392,853,706

Table III-2: Actuarial Value Summary as of June 30, 2015

Division	June 30, 2015	June 30, 2014
State General	\$ 5,549,137,149	\$ 5,334,025,804
State Police/Corrections	1,075,204,637	1,016,533,008
Municipal General	4,696,871,223	4,515,120,417
Municipal Police	1,865,190,859	1,772,210,104
Municipal Fire	888,515,174	844,926,189
Total Actuarial Value of Assets	\$ 14,074,919,042	\$ 13,482,815,522



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, 2015	June 30, 2014
Beginning of Year Market Value	\$ 14,428,500,519	\$ 12,707,740,926
Audit Adjustment	(3,707,780)	17,005,791
Revised Beginning of Year Market Value	\$ 14,424,792,739	\$ 12,724,746,717
Revenues:		
a. Member Contributions	\$ 251,237,811	\$ 238,695,585
b. Employer Contributions	317,163,961	301,601,232
c. Purchases of Service	7,681,968	8,214,497
d. Investment Income		
1. Interest, dividends, etc.	486,126,268	297,102,152
2. Realized/Unrealized gains (losses)	(205,270,228)	1,860,866,489
3. Security lending gains (losses)	(1,264,042)	(8,645,811)
e. Other Income	610,766	384,312
f. Settlement Award	24,685,547	-
g. Total Revenues	\$ 880,972,051	\$ 2,698,218,456
Expenditures :		
a. Benefit Payments	\$ 966,236,566	\$ 905,329,140
b. Refunds of Member Contributions	46,010,197	47,376,975
c. Investment Expenses	28,103,719	31,422,215
d. Administrative Expenses	9,885,765	10,336,324
e. Total Expenditures	\$ 1,050,236,247	\$ 994,464,654
End of Year Market Value	\$ 14,255,528,543	\$ 14,428,500,519

The market value rate of return for the plan year is 1.77% on an adjusted basis and 1.74% on an unadjusted basis. These returns are based on a simplified dollar-weighted basis which may not match more precise time-weighted return calculations. PERA's cash flow is (2.93)% 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 1.38 contributing active members for each member receiving a benefit as of June 30, 2015. 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, 2015
(Total PERA with Legislative Division)**

A. Actuarial Value Beginning of Year		\$	13,516,208,441
B. Market Value End of Year			14,255,528,543
C. Revised Market Value Beginning of Year			14,424,792,739
D. Cash Flow			
D1. Contributions		\$	568,401,772
D2. Service Purchases			7,681,968
D3. Benefit Payments and Refunds			(1,012,246,763)
D4. Administrative Expenses			(9,885,765)
D5. Other			25,296,313
D6. Net		\$	(420,752,475)
E. Investment Income			
E1. Market Total (B - C - D6)		\$	251,488,279
E2. Assumed Rate			7.75%
E3. Amount for Immediate Recognition			1,031,201,996
E4. Amount for Phased-In Recognition			(779,713,717)
F. Phased-In Recognition of Investment Income			
F1. Current Year: 0.25 *E4		\$	(194,928,429)
F2. First Prior Year (2013/2014)	\$ 1,168,148,463	x 25%	292,037,116
F3. Second Prior Year (2012/2013)	577,809,753	x 25%	144,452,438
F4. Third Prior Year (2011/2012)	(1,010,896,575)	x 25%	(252,724,144)
F5. Total Recognized Investment Gain		\$	(11,163,019)
G. Audit Adjustment		\$	(3,707,780)
H. Actuarial Value End of Year			\$14,111,787,163
(A + D6 + E3 + F5 + G)			
I. Difference Between Market & Actuarial Values		\$	143,741,380
J. Rate of Return on Actuarial Value			7.64 %
K. Actuarial Value as a Percentage of Market Value			98.99 %



Section III: PERA Assets

Table III-5: Allocation of Actuarial Value by Division as of June 30, 2015

	State Division		PERA Totals w/o Legislative
	General	Police	
Member Contribution Fund	\$ 849,806,169	\$ 58,543,902	\$ 2,372,865,506
Employer Contribution Fund	1,656,794,513	412,184,443	3,977,224,067
Retirement Reserve Fund	3,099,059,473	615,428,229	7,868,195,314
Total Fund Balances	\$ 5,605,660,155	\$ 1,086,156,574	\$ 14,218,284,887
Approximate % of Total Fund Balance*	39.43%	7.64%	100%
Actuarial Value Adjustment*	(56,523,006)	(10,951,937)	(143,365,845)
Total Actuarial Value of Assets	\$ 5,549,137,149	\$ 1,075,204,637	\$ 14,074,919,042

	Municipal Division			PERA Totals w/o Legislative
	General	Police	Fire	
Member Contribution Fund	\$ 1,033,953,619	\$ 258,992,011	\$ 171,569,805	\$ 2,372,865,506
Employer Contribution Fund	1,220,783,045	508,633,651	178,828,415	3,977,224,067
Retirement Reserve Fund	2,489,976,462	1,116,563,861	547,167,289	7,868,195,314
Total Fund Balances	\$ 4,744,713,126	\$ 1,884,189,523	\$ 897,565,509	\$ 14,218,284,887
Approximate % of Total Fund Balance*	33.37%	13.25%	6.31%	100.00%
Actuarial Value Adjustment*	(47,841,903)	(18,998,664)	(9,050,335)	(143,365,845)
Total Actuarial Value of Assets	\$ 4,696,871,223	\$ 1,865,190,859	\$ 888,515,174	\$ 14,074,919,042

* 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 0.26% 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 Fund is 7.75% 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 ending June 30, 2015.

Table III-6: Actuarial Investment Gain (Loss) for the Year Ending June 30, 2015
(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)	\$ 5,334.0	\$ 1,016.5	\$ 4,515.1	\$ 1,772.2	\$ 844.9	\$ 13,482.8
2. Employee and Employer Contributions	238.3	26.4	190.2	73.2	45.5	573.6
3. Benefit Payments	(460.4)	(45.9)	(313.2)	(120.8)	(70.3)	(1,010.6)
4. Administrative Expenses	(3.9)	(0.8)	(3.3)	(1.3)	(0.6)	(9.9)
5. Other	9.9	1.9	8.4	3.3	1.6	25.2
6. Interest [1 x 7.75% + (2 + 3 + 4 + 5) x 7.75% x 0.5]	405.0	78.1	345.4	135.6	64.6	1,028.6
7. Expected End of Year AVA	\$ 5,523.0	\$ 1,076.3	\$ 4,742.6	\$ 1,862.3	\$ 885.7	\$ 14,089.8
8. Actual End of Year AVA	5,549.1	1,075.2	4,696.9	1,865.2	888.5	14,074.9
9. Actuarial Investment Gain (Loss) (8 - 7)	\$ 26.2	\$ (1.1)	\$ (45.7)	\$ 2.9	\$ 2.8	\$ (14.9)



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, 2015

Division	Reported Fund Balances	Actuarial Present Value of Pensions Being Paid	Transfer
State General			
Members Contribution Fund	\$ 849,806,169		
Employers Accumulation Fund	1,656,794,513		\$ (2,342,156,097)
Retirement Reserve Fund	3,099,059,473	\$ 5,441,215,570	2,342,156,097
State Police/Corrections			
Members Contribution Fund	58,543,902		
Employers Accumulation Fund	412,184,443		-
Retirement Reserve Fund	615,428,229	589,740,952	-
Municipal General			
Members Contribution Fund	1,033,953,619		
Employers Accumulation Fund	1,220,783,045		(1,147,341,465)
Retirement Reserve Fund	2,489,976,462	3,637,317,927	1,147,341,465
Municipal Police			
Members Contribution Fund	258,992,011		
Employers Accumulation Fund	508,633,651		(521,194,230)
Retirement Reserve Fund	1,116,563,861	1,637,758,091	521,194,230
Municipal Fire			
Members Contribution Fund	171,569,805		
Employers Accumulation Fund	178,828,415		(384,175,546)
Retirement Reserve Fund	547,167,289	931,342,835	384,175,546
Total End of Year Market Value	\$ 14,218,284,887		



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, 2015

	Actuarial Accrued Liability	Present Value of Future Normal Cost	Total Actuarial Present Value
Active Members			
Service Retirement	\$ 5,763,853,225	\$ 1,914,446,212	\$ 7,678,299,437
Termination Benefits	230,791,604	664,889,195	895,680,799
Survivor Benefits	95,200,858	76,767,174	171,968,032
Disability Retirement	114,015,382	129,582,700	243,598,082
Total for Active Members	\$ 6,203,861,069	\$ 2,785,685,281	\$ 8,989,546,350
Inactive Members	\$ 345,250,106		\$ 345,250,106
Retirees and Beneficiaries			
Service Retirements	\$ 11,158,542,971		\$ 11,158,542,971
Beneficiaries	795,259,254		795,259,254
Disability Retirements	283,573,150		283,573,150
Total for Retirees and Beneficiaries	\$ 12,237,375,375		\$ 12,237,375,375
Total	\$ 18,786,486,550	\$ 2,785,685,281	\$ 21,572,171,831

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)

Calculation of UAAL

	State General	State Police/ Corrections	Municipal General	Municipal Police	Municipal Fire
1. Actuarial Accrued Liability	\$ 8,201.0	\$ 891.1	\$ 5,859.6	\$ 2,402.4	\$ 1,432.4
2. Actuarial Value of Assets	5,549.1	1,075.2	4,696.9	1,865.2	888.5
3. Unfunded Actuarial Accrued Liability (1-2)	2,651.9	(184.1)	1,162.7	537.2	543.9
Funded Ratio (2 / 1)	67.7%	120.7%	80.2%	77.6%	62.0%

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, 2015, the funded ratio of PERA is 74.9% as compared to a ratio of 75.8% as of June 30, 2014. Due to the salary losses from the 2015 plan year, there has been a slight decrease in the funded ratio across all divisions except State Police. 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	\$ 2,452.0	\$ (166.6)	\$ 1,022.1	\$ 491.4	\$ 502.8
2. Normal Cost, including expenses	144.8	20.5	122.7	50.6	33.9
3. Contributions	(238.3)	(26.4)	(190.2)	(73.2)	(45.5)
4. Other Income/Expense	(6.1)	(1.2)	(5.1)	(2.0)	(1.0)
5. Interest [(1 x 7.75%) + (2 + 3 + 4) x 7.75% x 0.5]	186.2	(13.2)	76.4	37.1	38.5
6. Expected End of Year	2,538.6	(186.9)	1,025.9	503.9	528.7
7. Assumption Changes	0	0	0	0	0
8. Plan Changes	0	0	0	0	0
9. Expected UAAL after changes (6 + 7 + 8)	2,538.6	(186.9)	1,025.9	503.9	528.7
10. Actual UAAL	2,651.9	(184.1)	1,162.7	537.2	543.9
11. Total Actuarial Gain (Loss)	(113.3)	(2.8)	(136.8)	(33.3)	(15.2)

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*
Expected Value	\$2,538.6	68.5 %	15.80 %	(\$186.9)	121.0 %	(11.21)%
Retirement	(\$6.5)	0.1 %	(0.01)%	(\$8.2)	1.0 %	(1.58)%
Disability	\$2.9	0.0 %	0.00 %	(\$0.3)	0.0 %	(0.06)%
Pre-Retirement Death	\$0.6	0.0 %	0.00 %	\$0.2	0.0 %	0.04 %
Withdrawal	(\$1.7)	0.0 %	0.00 %	\$1.3	(0.2)%	0.25 %
Pay Increases	\$116.2	(1.0)%	0.15 %	\$9.5	(1.1)%	1.83 %
New Entrants	\$38.5	(0.3)%	0.05 %	\$2.2	(0.3)%	0.42 %
Post-Retirement Death	\$28.7	(0.2)%	0.04 %	(\$1.3)	0.2 %	(0.25)%
Data Adjustments	(\$33.2)	0.3 %	(0.04)%	(\$0.9)	0.1 %	(0.17)%
Other	(\$6.0)	0.0 %	(0.01)%	(\$0.8)	0.1 %	(0.15)%
Investment Return	(\$26.2)	0.3 %	(0.03)%	\$1.1	(0.1)%	0.21 %
Total (Gain) or Loss	\$113.3	(0.8)%	0.15 %	\$2.8	(0.3)%	0.54 %
Assumption Changes	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %
Plan Changes	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %
Actual Value	\$2,651.9	67.7 %	15.95 %	(\$184.1)	120.7 %	(10.67)%

* Impact on Contribution Rate based on 30 year period and current 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*
Expected Value	\$1,025.9	82.2 %	6.75 %	\$503.9	78.7 %	12.80 %	\$528.7	62.6 %	22.37 %
Retirement	(\$13.2)	0.2 %	(0.09)%	(\$2.7)	0.1 %	(0.07)%	(\$5.3)	0.2 %	(0.22)%
Disability	\$3.2	0.0 %	0.02 %	\$1.7	(0.1)%	0.04 %	(\$0.1)	0.0 %	0.00 %
Pre-Retirement Death	(\$0.1)	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %	(\$0.1)	0.0 %	0.00 %
Withdrawal	\$6.6	(0.1)%	0.04 %	\$2.6	(0.1)%	0.07 %	\$3.6	(0.2)%	0.15 %
Pay Increases	\$70.3	(1.0)%	0.47 %	\$25.4	(0.8)%	0.64 %	\$15.1	(0.6)%	0.63 %
New Entrants	\$31.2	(0.4)%	0.21 %	\$9.4	(0.3)%	0.24 %	\$5.0	(0.2)%	0.21 %
Post-Retirement Death	\$23.2	(0.3)%	0.15 %	\$3.8	(0.1)%	0.10 %	\$0.6	0.0 %	0.03 %
Data Adjustments	(\$25.3)	0.3 %	(0.17)%	(\$2.7)	0.1 %	(0.07)%	\$0.1	0.0 %	0.00 %
Other	(\$4.8)	0.1 %	(0.03)%	(\$1.3)	0.0 %	(0.03)%	(\$0.9)	0.0 %	(0.04)%
Investment Return	\$45.7	(0.8)%	0.30 %	(\$2.9)	0.1 %	(0.07)%	(\$2.8)	0.2 %	(0.12)%
Total (Gain) or Loss	\$136.8	(2.0)%	0.90 %	\$33.3	(1.1)%	0.85 %	\$15.2	(0.6)%	0.64 %
Assumption Changes	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %
Plan Changes	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %	\$0.0	0.0 %	0.00 %
Actual Value	\$1,162.7	80.2 %	7.65 %	\$537.2	77.6 %	13.65 %	\$543.9	62.0 %	23.01 %

* Impact on Contribution Rate based on 30 year period and current 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, 2015	June 30, 2014
1. Total Valuation Payroll	\$ 971,004,683	\$ 894,030,067
2. Present Value of Future Benefits	9,249,965,799	8,756,027,758
3. Present Value of Future Normal Costs	1,048,960,046	970,036,861
4. Actuarial Accrued Liability (2 - 3)	\$8,201,005,753	\$7,785,990,897
5. Actuarial Value of Assets	5,549,137,149	5,334,025,804
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$2,651,868,604	\$2,451,965,093
7. UAAL Amortization Payment (30 year funding)	\$ 154,889,938	\$ 143,214,004
a. Amortization Payment as a Percent of Payroll (7 / 1)	15.95 %	16.02 %
8. Total Normal Cost	\$ 150,897,734	\$ 140,823,274
a. Normal Cost as a Percent of Payroll (8 / 1)	15.54 %	15.75 %
9. Expected Administrative Expenses	\$ 4,369,521	\$ 4,023,135
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.45 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 310,157,193	\$ 288,060,413
a. ADC Rate (7a + 8a + 9a)	31.94 %	32.22 %
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)	6.03 %	6.31 %



Section V: Actuarial Funding Calculation

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

	June 30, 2015	June 30, 2014
1. Total Valuation Payroll	\$ 100,760,269	\$ 94,756,252
2. Present Value of Future Benefits	1,054,337,120	1,003,530,287
3. Present Value of Future Normal Costs	163,202,355	153,607,495
4. Actuarial Accrued Liability (2 - 3)	\$ 891,134,765	\$ 849,922,792
5. Actuarial Value of Assets	1,075,204,637	1,016,533,008
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$(184,069,872)	\$(166,610,216)
7. UAAL Amortization Payment (30 year funding)	\$ (10,751,125)	\$ (9,731,344)
a. Amortization Payment as a Percent of Payroll (7 / 1)	(10.67)%	(10.27)%
8. Total Normal Cost	\$ 21,027,382	\$ 20,024,447
a. Normal Cost as a Percent of Payroll (8 / 1)	20.87 %	21.13 %
9. Expected Administrative Expenses	\$ 453,421	\$ 426,403
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.45 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 10,729,678	\$ 10,719,506
a. ADC Rate (7a + 8a + 9a)	10.65 %	11.31 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	25.58 %	25.59 %
b. Member Contribution Rate	8.72 %	8.71 %
c. Total Statutory Contribution Rate (a + b)	34.30 %	34.30 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	(23.65)%	(22.99)%



Section V: Actuarial Funding Calculation

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

	June 30, 2015	June 30, 2014
1. Total Valuation Payroll	\$ 887,246,752	\$ 843,346,077
2. Present Value of Future Benefits	6,720,619,699	6,345,746,412
3. Present Value of Future Normal Costs	861,023,944	808,569,000
4. Actuarial Accrued Liability (2 - 3)	\$5,859,595,755	\$5,537,177,412
5. Actuarial Value of Assets	4,696,871,223	4,515,120,417
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$1,162,724,532	\$1,022,056,995
7. UAAL Amortization Payment (30 year funding)	\$ 67,912,238	\$ 59,696,150
a. Amortization Payment as a Percent of Payroll (7 / 1)	7.65 %	7.08 %
8. Total Normal Cost	\$ 125,957,765	\$ 118,924,461
a. Normal Cost as a Percent of Payroll (8 / 1)	14.20 %	14.10 %
9. Expected Administrative Expenses	\$ 3,992,610	\$ 3,795,057
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.45 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 197,862,613	\$ 182,415,668
a. ADC Rate (7a + 8a + 9a)	22.30 %	21.63 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	9.86 %	9.87 %
b. Member Contribution Rate	<u>13.56 %</u>	<u>13.59 %</u>
c. Total Statutory Contribution Rate (a + b)	23.42 %	23.46 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	(1.12)%	(1.83)%



Section V: Actuarial Funding Calculation

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

	June 30, 2015	June 30, 2014
1. Total Valuation Payroll	\$ 229,858,822	\$ 216,410,720
2. Present Value of Future Benefits	2,807,653,334	2,647,059,264
3. Present Value of Future Normal Costs	405,272,394	383,494,456
4. Actuarial Accrued Liability (2 - 3)	\$2,402,380,940	\$2,263,564,808
5. Actuarial Value of Assets	1,865,190,859	1,772,210,104
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$ 537,190,081	\$ 491,354,704
7. UAAL Amortization Payment (30 year funding)	\$ 31,376,117	\$ 28,698,971
a. Amortization Payment as a Percent of Payroll (7 / 1)	13.65 %	13.26 %
8. Total Normal Cost	\$ 52,113,084	\$ 49,639,662
a. Normal Cost as a Percent of Payroll (8 / 1)	22.67 %	22.94 %
9. Expected Administrative Expenses	\$ 1,034,365	\$ 973,848
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.45 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 84,523,566	\$ 79,312,481
a. ADC Rate (7a + 8a + 9a)	36.77 %	36.65 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	18.69 %	18.65 %
b. Member Contribution Rate	<u>17.27 %</u>	<u>17.23 %</u>
c. Total Statutory Contribution Rate (a + b)	35.96 %	35.88 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	0.81 %	0.77 %



Section V: Actuarial Funding Calculation

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

	June 30, 2015	June 30, 2014
1. Total Valuation Payroll	\$ 138,072,649	\$ 127,301,495
2. Present Value of Future Benefits	1,739,595,879	1,635,159,850
3. Present Value of Future Normal Costs	307,226,542	287,439,073
4. Actuarial Accrued Liability (2 - 3)	\$1,432,369,337	\$1,347,720,777
5. Actuarial Value of Assets	888,515,174	844,926,189
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$ 543,854,163	\$ 502,794,588
7. UAAL Amortization Payment (30 year funding)	\$ 31,765,351	\$ 29,367,150
a. Amortization Payment as a Percent of Payroll (7 / 1)	23.01 %	23.07 %
8. Total Normal Cost	\$ 35,708,904	\$ 33,310,975
a. Normal Cost as a Percent of Payroll (8 / 1)	25.86 %	26.17 %
9. Expected Administrative Expenses	\$ 621,327	\$ 572,857
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.45 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 68,095,582	\$ 63,250,982
a. ADC Rate (7a + 8a + 9a)	49.32 %	49.69 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	21.58 %	21.56 %
b. Member Contribution Rate	17.58 %	17.58 %
c. Total Statutory Contribution Rate (a + b)	39.16 %	39.14 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	10.16 %	10.55 %



Section V: Actuarial Funding Calculation

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

	June 30, 2015	June 30, 2014
1. Total Valuation Payroll	\$ 2,326,943,176	\$ 2,175,844,611
2. Present Value of Future Benefits	21,572,171,831	20,387,523,571
3. Present Value of Future Normal Costs	2,785,685,281	2,603,146,885
4. Actuarial Accrued Liability (2 - 3)	\$18,786,486,550	\$17,784,376,686
5. Actuarial Value of Assets	14,074,919,042	13,482,815,522
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	\$ 4,711,567,508	\$ 4,301,561,164
7. UAAL Amortization Payment (30 year funding)	\$ 275,192,519	\$ 251,244,930
a. Amortization Payment as a Percent of Payroll (7 / 1)	11.83 %	11.55 %
8. Total Normal Cost	\$ 385,704,870	\$ 362,722,819
a. Normal Cost as a Percent of Payroll (8 / 1)	16.58 %	16.67 %
9. Expected Administrative Expenses	\$ 10,471,244	\$ 9,791,301
a. Administrative Expense as a Percent of Payroll (9 / 1)	0.45 %	0.45 %
10. Actuarially Determined Contribution (ADC)	\$ 671,368,633	\$ 623,759,050
a. ADC Rate (7a + 8a + 9a)	28.86 %	28.67 %
11. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	15.08 %	15.04 %
b. Member Contribution Rate	12.02 %	12.05 %
c. Total Statutory Contribution Rate (a + b)	27.10 %	27.09 %
12. (Excess) Shortfall of Statutory Rates (10a - 11c)	1.76 %	1.58 %

Table V-2: Contribution Rate Summary

Division	Employer Only		
	Current Statutory Rate	30-year Rate	Difference
State General	16.99 %	23.02 %	6.03 %
State Police/Corrections	25.58 %	1.93 %	(23.65)%
Municipal General	9.86 %	8.74 %	(1.12)%
Municipal Police	18.69 %	19.50 %	0.81 %
Municipal Fire	21.58 %	31.74 %	10.16 %
PERA Total	15.08 %	16.84 %	1.76 %



Section V: Actuarial Funding Calculation

Table V-3: Statutory Contribution Rate Summary

Division and Coverage Plan	Contribution Rates	
	Member	Employer
State Division		
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*	8.72 %	25.58 %
Municipal Division		
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*	13.56 %	9.86 %
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*	17.27 %	18.69 %
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*	17.58 %	21.58 %

* 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: Accounting 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. GASB Statement No. 25 information is provided below.

Table VI-1: GASB Statement No. 25 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 (c)	UAAL as a Percentage of Annual Payroll ((b - a) / c)
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 %
6/30/2007	12,032,214,874	12,962,480,229	930,265,355	92.8 %	1,908,519,615	48.7 %
6/30/2006	10,850,217,103	11,781,722,238	931,505,135	92.1 %	1,774,918,446	52.5 %
6/30/2005	9,997,484,609	10,902,768,775	905,284,166	91.7 %	1,607,838,716	56.3 %



Section VI: Accounting 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)
6/30/2015	\$ 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	
6/30/2013	841,174,061	5,064,595,209	1,617,991,066	4,996,425,681	100.00	82.05	0.00	
6/30/2012	787,435,758	5,117,428,346	1,914,051,334	4,724,562,943	100.00	76.94	0.00	
6/30/2011	796,011,595	4,725,622,520	1,961,725,462	4,883,299,367	100.00	86.49	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)
6/30/2015	\$ 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	
6/30/2013	58,260,570	525,211,454	246,248,914	926,108,695	100.00	100.00	100.00	
6/30/2012	54,156,044	561,452,471	278,404,119	851,976,386	100.00	100.00	84.90	
6/30/2011	53,270,846	522,073,854	271,764,015	862,058,143	100.00	100.00	100.00	



Section VI: Accounting Information

Municipal General

Valuation Date	Aggregate Accrued Liabilities For				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)	Actuarial Value of Assets	(1)	(2)	(3)
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
6/30/2013	1,000,561,795	3,309,385,678	1,005,890,251	4,108,957,408	100.00	93.93	0.00
6/30/2012	949,311,379	3,336,286,064	1,192,111,747	3,808,143,673	100.00	85.69	0.00
6/30/2011	926,331,337	3,086,715,812	1,107,402,880	3,845,662,093	100.00	94.58	0.00

Municipal Police

Valuation Date	Aggregate Accrued Liabilities For				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)	Actuarial Value of Assets	(1)	(2)	(3)
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
6/30/2013	247,882,167	1,413,249,313	485,163,146	1,627,455,783	100.00	97.62	0.00
6/30/2012	231,924,646	1,488,001,979	566,994,541	1,504,516,513	100.00	85.52	0.00
6/30/2011	231,902,509	1,374,649,843	540,837,909	1,527,062,745	100.00	94.22	0.00

Municipal Fire

Valuation Date	Aggregate Accrued Liabilities For				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)	Actuarial Value of Assets	(1)	(2)	(3)
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
6/30/2013	163,287,521	822,738,793	255,740,084	779,204,098	100.00	74.86	0.00
6/30/2012	147,973,606	875,612,944	286,898,869	722,847,504	100.00	65.65	0.00
6/30/2011	146,327,512	816,875,672	264,880,643	737,135,025	100.00	72.33	0.00



Section VI: Accounting 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)
6/30/2015	\$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	
6/30/2013	2,311,166,114	11,135,180,447	3,611,033,461	12,438,151,665	100.00	90.95	0.00	
6/30/2012	2,170,801,433	11,378,781,804	4,238,460,610	11,612,047,019	100.00	82.97	0.00	
6/30/2011	2,153,843,799	10,525,937,701	4,146,610,909	11,855,217,373	100.00	92.17	0.00	



Section VI: Accounting 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		
6/30/2015	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
6/30/2013	1,285	43,656,998	358	7,006,726	15,318	408,580,147	9.85	26,673
6/30/2012	1,075	35,697,983	323	5,911,795	14,391	371,929,875	8.71	25,845
6/30/2011	1,005	34,914,890	347	6,179,881	13,639	342,143,687	9.17	25,086

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		
6/30/2015	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
6/30/2013	60	2,706,075	23	725,085	1,326	39,638,875	5.26	29,894
6/30/2012	83	3,323,294	21	561,598	1,289	37,657,885	7.91	29,215
6/30/2011	90	3,480,618	20	507,415	1,227	34,896,189	9.31	28,440



Section VI: Accounting 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		
6/30/2015	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
6/30/2013	933	29,438,538	281	4,828,481	10,711	260,927,446	10.41	24,361
6/30/2012	761	23,166,131	240	3,984,904	10,059	236,317,389	8.83	23,493
6/30/2011	767	23,981,216	269	3,952,559	9,538	217,136,162	10.16	22,765

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		
6/30/2015	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
6/30/2013	177	8,276,701	46	1,276,954	2,855	101,829,308	7.38	35,667
6/30/2012	183	8,670,002	33	967,953	2,724	94,829,561	8.84	34,813
6/30/2011	166	8,033,315	30	821,737	2,574	87,127,512	9.02	33,849

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		
6/30/2015	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
6/30/2013	70	4,239,651	20	590,379	1,653	61,457,584	6.31	37,179
6/30/2012	86	4,861,646	31	901,384	1,603	57,808,312	7.35	36,063
6/30/2011	98	5,203,080	23	617,946	1,548	53,848,050	9.31	34,786



Section VI: Accounting Information

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		
6/30/2015	2,970	\$74,003,973	860	\$18,095,510	35,672	\$ 994,731,223	5.96%	\$ 27,885
6/30/2014	2,443	81,759,729	744	15,370,329	33,562	938,822,760	7.61	27,973
6/30/2013	2,525	88,317,963	728	14,427,625	31,863	872,433,360	9.25	27,381
6/30/2012	2,188	75,719,056	648	12,327,634	30,066	798,543,022	8.62	26,560
6/30/2011	2,126	75,613,119	689	12,079,538	28,526	735,151,600	9.46	25,771

Table VI-4: Summary of Actuarial Methods and Assumptions

Valuation date	June 30, 2015
Actuarial cost method	Entry Age Normal
Amortization method	Level Percent of Payroll, Open
Payroll growth rate	3.50%
Remaining amortization period	30 years
Asset valuation method	4-year Smoothed Market
Actuarial assumptions:	
Investment rate of return*	7.75%
Administrative expenses	0.45% of payroll
Projected salary increases*	4.00% – 14.25%
Post-retirement benefit increases	2.00% compounded annually (2.50% for certain retirees and disabled participants with annual benefits less than \$20,000)

* Includes inflation at 3.00%



Appendix A: Additional Membership Data

Table A-1: Schedule of Active Participant Data as of June 30, 2015 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	35							35	\$ 971,285	
20 to 24	503	5						508	14,503,777	
25 to 29	1,328	255	6					1,589	55,735,888	
30 to 34	1,322	717	240	6				2,285	91,924,714	
35 to 39	1,014	667	503	209	4			2,397	108,071,645	
40 to 44	900	525	571	481	179			2,656	127,087,167	
45 to 49	951	524	548	439	459	39		2,960	145,105,081	
50 to 54	760	547	548	406	500	81	5	2,847	139,408,258	
55 to 59	609	522	483	416	412	78	9	2,529	126,348,813	
60	96	102	103	99	74	17	7	498	25,692,570	
61	91	84	85	77	50	14	1	402	19,992,079	
62	69	64	91	52	35	13	3	327	16,759,294	
63	84	64	77	43	39	21	4	332	18,798,204	
64	58	54	50	38	24	5	2	231	12,482,791	
65	36	34	32	25	24	6	4	161	8,610,723	
66	32	29	24	14	15	5	2	121	6,599,756	
67	19	28	16	16	9	4		92	4,783,454	
68	17	16	21	9	3	2		68	3,965,909	
69	12	15	10	6	5	2	1	51	2,728,359	
70	12	10	6	4	1	1	1	35	1,829,733	
71	7	8	4	6				25	1,682,199	
72	11	6	7	5	2	2		33	1,578,867	
73	2	3	10	1	1	2		19	827,885	
74	4	4	2	2	1		1	14	646,655	
75	4	2	3		1			10	557,414	
76	2	1	1	2				6	373,587	
77	2	2	1	2		1	1	9	472,991	
78	2	2		2				6	379,759	
79								0		
80 & Over	2	1	1	1	1		1	7	249,922	
Total	7,984	4,291	3,443	2,361	1,839	293	42	20,253	\$ 938,168,776	

Average Age: 45.19

Average Service: 8.93



Appendix A: Additional Membership Data

State Police/Corrections

Nearest Age	Completed Years of Service								Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	Total	
Under 20	6							6	\$ 213,965
20 to 24	209	6	1					216	8,911,395
25 to 29	228	91	13					332	15,275,549
30 to 34	124	75	96	27				322	16,267,914
35 to 39	68	65	70	74	15			292	15,959,497
40 to 44	33	41	44	80	63	2		263	15,979,531
45 to 49	33	31	35	40	49	12	1	201	11,638,514
50 to 54	19	20	22	26	22	8	4	121	6,089,682
55 to 59	13	13	18	22	11	2	3	82	4,565,175
60	1		2	4	3		1	11	683,611
61	3	2	2	2	2		1	12	582,522
62	3		1		1			5	268,395
63	1					1		2	98,865
64		1	1	3		2		7	368,759
65			1				1	2	124,355
66	1							1	59,320
67			1	2				3	173,705
68									
69									
70									
71	1							1	41,190
72									
73									
74						1		1	50,973
75									
76									
77									
78									
79									
80 & Over									
Total	743	345	307	280	166	28	11	1,880	\$ 97,352,917

Average Age: 36.80

Average Service: 9.38



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	164							164	\$ 4,817,248
20 to 24	1,112	12						1,124	32,024,939
25 to 29	1,499	443	15					1,957	64,517,700
30 to 34	1,168	715	254	11				2,148	78,481,254
35 to 39	1,044	680	463	192	10			2,389	94,864,718
40 to 44	1,072	710	461	360	220	2		2,825	119,569,652
45 to 49	839	549	467	419	354	58	2	2,688	118,446,980
50 to 54	807	605	476	403	341	111	14	2,757	120,964,453
55 to 59	676	606	457	397	369	115	27	2,647	116,160,846
60	109	103	83	59	53	15	3	425	18,782,224
61	108	81	82	63	41	15	6	396	17,055,720
62	96	83	68	52	37	12	6	354	14,735,999
63	67	71	69	44	19	6	3	279	12,414,121
64	57	62	56	27	20	10	4	236	10,914,581
65	41	51	34	26	17	4	2	175	7,800,001
66	44	40	24	18	10	5	2	143	6,342,026
67	43	27	23	12	6	8	2	121	5,231,636
68	33	19	22	9	6	4	1	94	3,738,330
69	26	12	10	3	8	3		62	2,542,502
70	21	9	5	3				38	1,137,495
71	15	9	10	7	3		2	46	1,805,744
72	10	11	5	2	1	3		32	1,163,998
73	5	6	4	3	3	1		22	743,622
74	12	5	4		1			22	774,450
75	2	4	3	1	2			12	410,130
76	3	3	1	3				10	286,617
77	5		1	1				7	115,172
78	1	3	2	1				7	193,720
79	4	3	1					8	275,126
80 & Over	12	7	4		4	2		29	932,237
Total	9,095	4,929	3,104	2,116	1,525	374	74	21,217	\$ 857,243,239

Average Age: 44.26

Average Service: 8.25



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	4							4	\$ 162,145
20 to 24	202	2						204	8,884,599
25 to 29	457	163	2					622	32,282,542
30 to 34	231	315	118					664	39,748,555
35 to 39	148	190	240	95	1	0	0	674	43,300,787
40 to 44	79	104	163	243	35	1		625	42,517,435
45 to 49	51	66	105	158	56	8		444	29,586,296
50 to 54	29	36	53	73	32	9		232	15,184,896
55 to 59	16	18	28	26	8	4	1	101	5,983,780
60	1	4	4	4	1			14	763,335
61	1	5	4	4	3	2		19	1,170,898
62	3		1	2	2	1		9	555,977
63	3	5		1	2	1		12	716,953
64	1			3			1	5	278,271
65				4			1	5	378,954
66				1			2	3	202,851
67	1							1	46,154
68	3		2					5	181,808
69	2							2	98,842
70									
71									
72									
73									
74									
75									
76									
77									
78	1							1	32,940
79									
80 & Over				1				1	7,800
Total	1,233	908	720	615	140	26	5	3,647	\$ 222,085,818

Average Age: 37.65

Average Service: 9.01



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	1							1	\$ 24,352
20 to 24	106	3						109	4,366,656
25 to 29	222	107	2					331	16,054,901
30 to 34	153	242	84	1				480	28,031,149
35 to 39	93	166	184	58				501	31,100,733
40 to 44	27	67	109	131	21			355	24,369,997
45 to 49	14	32	59	97	27	3		232	16,482,774
50 to 54	2	8	18	48	19	4	2	101	7,972,333
55 to 59	1	7	6	23	6	3		46	3,502,381
60	1	1	1	2	1		1	7	456,631
61						1		1	115,949
62			1	2			1	4	351,969
63					1		1	2	146,731
64			1					1	64,701
65						1		1	109,565
66	1	1	1					3	187,196
67									
68									
69									
70									
71									
72									
73									
74									
75			1					1	65,510
76									
77									
78									
79									
80 & Over									
Total	621	634	467	362	75	12	5	2,176	\$ 133,403,526

Average Age: 36.88

Average Service: 9.45



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	210							210	\$ 6,188,995	
20 to 24	2,132	28	1					2,161	68,691,365	
25 to 29	3,734	1,059	38					4,831	183,866,580	
30 to 34	2,998	2,064	792	45				5,899	254,453,587	
35 to 39	2,367	1,768	1,460	628	30			6,253	293,297,380	
40 to 44	2,111	1,447	1,348	1,295	518	5		6,724	329,523,781	
45 to 49	1,888	1,202	1,214	1,153	945	120	3	6,525	321,259,645	
50 to 54	1,617	1,216	1,117	956	914	213	25	6,058	289,619,622	
55 to 59	1,315	1,166	992	884	806	202	40	5,405	256,560,995	
60	208	210	193	168	132	32	12	955	46,378,371	
61	203	172	173	146	96	32	8	830	38,917,169	
62	171	147	162	108	75	26	10	699	32,671,633	
63	155	140	146	88	61	29	8	627	32,174,873	
64	116	117	108	71	44	17	7	480	24,109,103	
65	77	85	67	55	41	11	8	344	17,023,598	
66	78	70	49	33	25	10	6	271	13,391,149	
67	63	55	40	30	15	12	2	217	10,234,949	
68	53	35	45	18	9	6	1	167	7,886,046	
69	40	27	20	9	13	5	1	115	5,369,703	
70	33	19	11	7	1	1	1	73	2,967,227	
71	23	17	14	13	3		2	72	3,529,133	
72	21	17	12	7	3	5		65	2,742,865	
73	7	9	14	4	4	3		41	1,571,506	
74	16	9	6	2	2	1	1	37	1,472,077	
75	6	6	7	1	3			23	1,033,053	
76	5	4	2	5				16	660,205	
77	7	2	2	3		1	1	16	588,162	
78	4	5	2	3				14	606,418	
79	4	3	1					8	275,126	
80 & Over	14	8	5	2	5	2	1	37	1,189,959	
Total	19,676	11,107	8,041	5,734	3,745	733	137	49,173	\$ 2,248,254,276	

Average Age: 43.54

Average Service: 8.69



Appendix A: Additional Membership Data

Table A-2: Number of Annual Retirement Allowances of Benefit Recipients as of June 30, 2015

Type of Pension	Number	Total Annual Benefits	Average Annual Pension
Service Retirement Pensions			
Single Life Pension Terminating Upon Death*	13,185	\$ 381,744,341	\$ 28,953
Two Life 100% Survivor Pension			
Retired Member Recipient*	12,238	366,050,578	29,911
Survivor Recipient	2,161	46,382,478	21,463
Two Life 50% Survivor Pension			
Retired Member Recipient*	4,512	141,380,112	31,334
Survivor Recipient	848	10,619,586	12,523
Single Life with Temporary Child Survivor Pension			
Retired Member Recipient*	225	8,547,358	37,988
Child Recipient	4	123,956	30,989
Total Service Retirement Pensions	33,173	\$ 954,848,409	\$ 28,784
Disability Retirement Pensions			
Single Life Pension Terminating Upon Death*	350	\$ 5,704,449	\$ 16,298
Two Life 100% Survivor Pension			
Retired Member Recipient*	669	10,794,391	16,135
Survivor Recipient	181	2,689,461	14,859
Two Life 50% Survivor Pension			
Retired Member Recipient*	136	2,424,552	17,828
Survivor Recipient	21	176,171	8,389
Single Life with Temporary Child Survivor Pension			
Retired Member Recipient*	10	163,592	16,359
Child Recipient	3	54,193	18,064
Total Disability Retirement Pensions	1,370	\$ 22,006,809	\$ 16,063
Pre-Retirement Survivor Pensions			
Spouse Recipient	1,080	\$ 17,400,214	16,111
Child Recipient	49	475,791	9,710
Total Pre-Retirement Survivor Pensions	1,129	\$ 17,876,005	\$ 15,833
Total Pensions Being Paid	35,672	\$ 994,731,223	\$ 27,885

* Includes Co-Payees



Appendix A: Additional Membership Data

Table A-3: Distribution of Participants Receiving Benefits as of June 30, 2015

Attained Age	Retired Member		Disabled Member		Survivor Beneficiaries		Totals	
	Number	Annual Pensions	Number	Annual Pensions	Number	Annual Pensions	Number	Annual Pensions
Under 40	15	\$ 362,564	41	\$ 644,240	245	\$ 3,540,231	301	\$ 4,547,035
40 to 44	296	11,351,174	69	1,237,551	110	1,752,829	475	14,341,554
45 to 49	1,274	48,081,048	129	2,690,782	153	2,480,224	1,556	53,252,054
50 to 54	2,758	103,696,140	222	4,073,076	224	4,005,111	3,204	111,774,327
55 to 59	3,507	128,707,155	304	5,078,651	337	6,321,337	4,148	140,107,143
60 to 64	4,880	162,712,431	301	4,534,253	460	9,262,449	5,641	176,509,133
65 to 69	6,725	187,656,463	74	655,483	526	10,538,083	7,325	198,850,029
70 to 74	4,480	114,963,958	2	48,615	578	11,613,184	5,060	126,625,757
75 to 79	3,044	72,893,485			569	10,136,488	3,613	83,029,973
80 to 84	1,813	40,751,281			516	9,047,946	2,329	49,799,227
85 to 89	944	19,221,777			359	5,838,723	1,303	25,060,500
90 to 94	339	6,253,549			199	2,586,836	538	8,840,385
95 to 99	82	954,886			57	691,965	139	1,646,851
100 & Over	26	240,811			14	106,444	40	347,255
Total	30,183	\$897,846,722	1,142	\$ 18,962,651	4,347	\$ 77,921,850	35,672	\$ 994,731,223



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+	
State General								
Average Monthly Benefit*	\$ 605	\$ 899	\$ 1,420	\$ 2,012	\$ 2,738	\$ 3,194	\$3,132	\$2,431
Average Final Average Salary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Retirees/Beneficiaries*	520	1,484	1,605	1,593	2,147	5,734	677	13,760
State Police/Corrections								
Average Monthly Benefit*	\$ 1,205	\$1,717	\$ 1,579	\$ 2,251	\$ 2,845	\$ 3,305	\$3,822	\$2,855
Average Final Average Salary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Retirees/Beneficiaries*	33	59	64	83	226	434	62	961
Municipal General								
Average Monthly Benefit*	\$ 854	\$ 736	\$ 1,189	\$ 1,839	\$ 2,619	\$ 3,078	\$3,145	\$2,270
Average Final Average Salary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Retirees/Beneficiaries*	278	1,078	1,189	1,195	1,485	3,724	363	9,312
Municipal Police								
Average Monthly Benefit*	\$ 2,054	\$1,589	\$ 2,080	\$ 3,167	\$ 3,584	\$ 3,925	\$3,657	\$3,413
Average Final Average Salary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Retirees/Beneficiaries*	42	49	81	467	1,702	133	35	2,509
Municipal Fire								
Average Monthly Benefit*	\$ 2,229	\$2,032	\$ 2,767	\$ 3,247	\$ 3,692	\$ 3,694	\$3,400	\$3,547
Average Final Average Salary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Retirees/Beneficiaries*	10	23	48	220	1,027	57	35	1,420
Totals for All Divisions								
Average Monthly Benefit*	\$ 793	\$ 874	\$ 1,371	\$ 2,187	\$ 3,082	\$ 3,169	\$3,196	\$2,536
Average Final Average Salary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Retirees/Beneficiaries*	883	2,693	2,987	3,558	6,587	10,082	1,172	27,962

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

- State General – 488
- State Police/Corrections – 202
- Municipal General – 319
- Municipal Police – 136
- Municipal Fire – 54



Appendix A: Additional Membership Data

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

Division	2010-11 Retirees	2011-12 Retirees	2012-13 Retirees	2013-14 Retirees	2014-15 Retirees	All Current Retirees
State General						
Number	773	833	932	897	781	14,248
Average Monthly Benefit at Retirement	\$ 2,429	\$ 2,291	\$ 2,357	\$ 2,341	\$ 2,306	\$ 1,952
Average Age at Retirement	59.36	59.85	59.48	59.05	60.11	57.32
State Police/Corrections						
Number	67	64	56	69	58	1,163
Average Monthly Benefit at Retirement	\$ 2,733	\$ 2,618	\$ 2,655	\$ 2,878	\$ 2,748	\$ 2,300
Average Age at Retirement	52.28	52.61	52.32	50.52	50.41	51.20
Municipal General						
Number	575	559	645	702	631	9,631
Average Monthly Benefit at Retirement	\$ 2,322	\$ 2,150	\$ 2,165	\$ 2,198	\$ 2,132	\$ 1,875
Average Age at Retirement	58.72	59.36	59.78	59.64	60.11	57.65
Municipal Police						
Number	129	143	149	161	146	2,645
Average Monthly Benefit at Retirement	\$ 3,333	\$ 3,336	\$ 3,306	\$ 3,612	\$ 3,396	\$ 2,761
Average Age at Retirement	49.53	47.64	48.49	48.62	49.09	47.59
Municipal Fire						
Number	77	62	59	87	60	1,474
Average Monthly Benefit at Retirement	\$ 3,720	\$ 3,944	\$ 3,609	\$ 3,831	\$ 4,162	\$ 2,801
Average Age at Retirement	49.41	48.70	48.58	48.87	50.36	47.82
Totals for All Current Retirees						
Number	1,621	1,661	1,841	1,916	1,676	29,161
Average Monthly Benefit at Retirement	\$ 2,537	\$ 2,408	\$ 2,416	\$ 2,482	\$ 2,417	\$ 2,057
Average Age at Retirement	57.59	57.94	58.13	57.62	58.46	55.82



Appendix B: Summary of Actuarial Assumptions & Methods

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 3.5% per year (4.0% prior to the June 30, 2014 valuation) 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 & Methods

Actuarial Assumptions Used for the Valuation (effective with June 30, 2014 Valuation)

Assumed Rate of Investment Return. 7.75% per annum net of investment expenses.

Administrative Expenses. 0.45% of payroll.

Price Inflation. 3.0% per annum, compounded annually.

Real Investment Return. 4.75% over price inflation (4.25% 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	3.00%	3.00%	3.00%	3.00%	3.00%
Other Factors	0.50	0.50	0.50	0.50	0.50
Increase Due to Merit/Longevity:					
State General	7.75	1.75	0.50	0.50	0.50
State Police	10.75	6.25	1.75	1.75	1.75
State Corrections	9.75	2.75	1.75	1.75	1.75
Municipal General*	2.25	1.75	0.50	0.50	0.50
Municipal Police	8.25	3.25	2.00	1.25	1.25
Municipal Fire	8.25	3.25	2.00	2.00	2.00

* Includes Municipal Detention Officers



Appendix B: Summary of Actuarial Assumptions & 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 RP-2000 Mortality Tables (Combined table for healthy post-retirement, Employee table for active members, and Disabled table for disabled retirees before retirement age) with projection to 2018 using Scale AA.

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								
Pre-Retirement			Post-Retirement			Disabled		
Age	Male	Female	Age	Male	Female	Age	Male	Female
25	0.03%	0.02%	45	0.12%	0.08%	45	1.78%	0.56%
30	0.04	0.02	50	0.15	0.12	50	2.09	0.85
35	0.07	0.04	55	0.26	0.24	55	2.51	1.43
40	0.09	0.05	60	0.50	0.46	60	3.14	2.00
45	0.12	0.08	65	0.99	0.89	65	Uses healthy post-retirement rates upon surviving to normal retirement age.	
50	0.15	0.12	70	1.69	1.53	70		
55	0.21	0.22	75	2.94	2.43	75		
60	0.36	0.36	80	5.37	4.04	80		
65	0.59	0.53	85	9.76	6.95	85		



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	State	Municipal General		Municipal	Municipal
	Male	Female	Police	Corrections	Male	Female	Police	Fire
40	55%	60%	60%	60%	55%	55%	60%	45%
45	55	60	60	60	55	55	50	35
50	55	60	50	50	55	55	50	30
55	55	60	50	50	55	55	50	50
60	35	40	50	50	30	30	50	50
65	25	30	100	50	30	35	50	50
70	25	30		100	25	25	100	100
75	25	30			25	25		
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	State	Municipal General		Municipal	Municipal
	Male	Female	Police	Corrections	Male	Female	Police	Fire
40	40%	35%	40%	50%	35%	35%	30%	40%
45	40	35	40	50	35	35	30	35
50	40	35	50	50	40	40	30	30
55	40	35	35	50	30	25	30	30
60	30	40	35	50	30	30	30	20
65	30	35	100	40	35	35	50	50
70	25	30		100	25	25	100	100
75	25	25			25	25		
80	100	100			100	100		



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	10+
State Police	8.00%	7.00%	4.00%	4.00%	4.00%
State Corrections	20.00	16.00	9.00	8.00	6.00
Municipal Detention	22.00	16.00	10.00	10.00	6.00
Municipal Police	14.00	9.50	6.80	5.15	3.80
Municipal Fire	10.00	7.50	5.00	3.30	3.00

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%	0.05%	0.14%	
30	0.04	0.03	0.09	0.16	
35	0.08	0.06	0.14	0.21	
40	0.13	0.12	0.35	0.27	
45	0.24	0.20	0.42	0.46	
50	0.41	0.39	0.69	0.90	
55	0.57	0.61	1.59	1.40	
60	0.74	0.73	2.31	1.88	
65	0.75	0.73	2.31	1.88	

Rates Becoming Disabled at Indicated Ages (Municipal Division)					
Sample Ages	Municipal General		Municipal	Municipal	Municipal
	Male	Female	Detention	Police	Fire
25	0.05%	0.04%	0.06%	0.07%	0.02%
30	0.08	0.04	0.10	0.08	0.02
35	0.12	0.04	0.15	0.12	0.02
40	0.17	0.06	0.22	0.17	0.08
45	0.25	0.14	0.32	0.26	0.08
50	0.40	0.25	0.51	0.42	0.33
55	0.65	0.39	0.85	0.73	0.33
60	0.80	0.51	1.04	1.22	1.17
65	0.82	0.59	1.07	1.22	1.17



Appendix B: Summary of Actuarial Assumptions & Methods

Miscellaneous and Technical Assumptions

Marriage Assumption:	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.
Pay Increase Timing:	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.
Decrement Timing:	All decrements are assumed to occur at the beginning of the plan year.
Eligibility Testing:	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.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Neither disability nor withdrawal decrements operate during retirement eligibility.
Loads:	Retiree liabilities were increased by 1% to account for the pop-up provision.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report and the actual payroll payable at the time contributions are made.
Normal Form of Benefit:	A straight life payment is the assumed normal form of benefit.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Data Changes:	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

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

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

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

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

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

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%