

**NORTH DAKOTA**

**PUBLIC EMPLOYEES RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JULY 1, 2016**

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October 20, 2016

Board Members  
North Dakota Public Employees Retirement System  
Bismarck, North Dakota

Members of the Board:

We are pleased to provide our formal annual Actuarial Valuation Report as of July 1, 2016, for the North Dakota Public Employees Retirement System (“NDPERS”). The actuarial valuation was performed at the request of the Board and is intended for use by the Board and NDPERS and those designated by the Board and NDPERS. This report may be provided to parties other than the Board and NDPERS only in its entirety and only with the permission of the Board and NDPERS.

This report provides, among other things, the actuarial employer contribution to the NDPERS for the Plan Year commencing July 1, 2016, and ending on June 30, 2017. This actuarial valuation also provides information required by GASB Statement No. 67. Information required by GASB Statement No. 68 and the employer allocation of the Net Pension Liability are provided in a separate report. This report contains the asset values for the NDPERS groups and the Highway Patrol Retirement System (“HPRS”). The actuarial valuation results for the HPRS are contained in a separate report. This report should not be relied on for any purpose other than the purpose described.

The actuarial valuation was based upon information furnished by the NDPERS Staff, concerning benefits provided by the North Dakota Public Employees Retirement System, financial transactions, plan provisions and census data for active members, terminated members, retirees and beneficiaries as of July 1, 2016. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the NDPERS Staff.

The actuarial assumptions used were based on an experience review for the five-year period ending July 1, 2014, which was performed by the prior actuary, and were first adopted for use commencing with the July 1, 2015, actuarial valuation.

The plan provisions were unchanged since the last actuarial valuation as of July 1, 2015. Members hired into the Main System after December 31, 2015, are subject to later retirement conditions. Members covered under these provisions were first reflected in the actuarial valuation as of July 1, 2016.

To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the North Dakota Public Employees Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Lance J. Weiss and Amy Williams are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

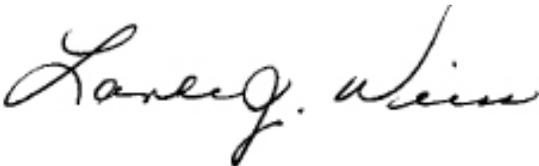
The signing actuaries are independent of the plan sponsor.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

We will be pleased to review this report with you at your convenience.

Respectfully submitted,

Gabriel, Roeder, Smith & Company



Lance J. Weiss, E.A., M.A.A.A., F.C.A.  
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cc: Mr. Sparb Collins, NDPERS  
Mr. Bryan Reinhardt, NDPERS  
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**SECTION A**

ACTUARIAL VALUATION RESULTS

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# COMMENTS ON THE ACTUARIAL VALUATION

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## **Purpose**

At your request, we have performed an actuarial valuation of the North Dakota Public Employees Retirement System as of July 1, 2016.

The purposes of this actuarial valuation are as follows:

- To determine the funding status of the System as of the actuarial valuation date;
- To determine the actuarial employer contribution rate for the fiscal year beginning July 1, 2016; and
- To provide other data required by NDPERS.

Pension plan financial reporting under GASB Statement No. 67 is provided in Section D of this report. Employer financial reporting under GASB Statement No. 68 is provided in a separate report.

## **Membership Data**

We received the data from the North Dakota Public Employees Retirement System Staff. We performed certain checks for reasonableness and found the data to be complete and reliable for actuarial valuation purposes. However, we did not audit the data.

A total of 23,416 active members (including the Main System, Judges and Law Enforcement) were included in the actuarial valuation as of July 1, 2016. Between the 2015 and 2016 actuarial valuations, the number of active employees increased by 571 members, or 2.5 percent. The average annual valuation pay increased by 6.4 percent, from \$42,096 to \$44,779 between the 2015 and 2016 actuarial valuations. There were 7,515 active members who were eligible for retirement (normal, early or Rule of 85) as of July 1, 2016.

The number of benefit recipients (excluding 3 members receiving benefits under the Special Prior Service Plan) increased from 10,094 to 10,515, or 4.2 percent, since the last actuarial valuation. The average monthly benefit increased by 1.3 percent, from \$1,120 to \$1,135. During the year ending June 30, 2016, there were 760 members awarded a benefit.

There were 5,424 inactive members (and an additional 6 members on leave of absence) as of July 1, 2016, who were vested and elected to receive a deferred benefit. The average monthly deferred benefit is \$5,946. There were 5,277 inactive members as of July 1, 2016, who were not vested or elected to receive a refund of contributions. There were an additional 26 members on leave of absence who were valued as inactive members that elected a refund of contributions.

Section C summarizes the membership data.

## **Plan Provisions**

Section F outlines the principal benefit provisions of the System.

The plan provisions were unchanged from the last valuation as of July 1, 2015. Members hired into the Main System after December 31, 2015, are subject to later retirement conditions. Members covered under these provisions were first reflected in the actuarial valuation as of July 1, 2016.

## COMMENTS ON THE ACTUARIAL VALUATION (CONTINUED)

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### **Actuarial Assumptions and Methods**

The actuarial assumptions used in the actuarial valuation as of July 1, 2016, were based on an experience review for the five-year period ending July 1, 2014, which was performed by the prior actuary. The assumptions were first adopted for use commencing with the July 1, 2015, valuation.

Section E outlines the actuarial assumptions and methods used in the actuarial valuation. The assumption for administrative expenses is equal to the prior years' administrative expenses, adjusted for inflation. In total, this amount has increased from \$2,448,847 to \$2,626,622.

Under the current asset valuation method to calculate the actuarial value of assets, interest and dividends are immediately recognized and the total appreciation or depreciation from the current year (net change in fair value of investments) is recognized over a five-year period.

The current asset valuation method has a systematic bias toward the actuarial value of assets being lower than the market value of assets.

The actuarial contribution rate is calculated using a 20-year open period, level percentage of payroll amortization method. The remaining amortization period will be reset to 20 years in each future actuarial valuation.

The actuarial assumptions were provided by, and are the responsibility of, the NDPERS Board. GRS was unable to judge the reasonableness of the actuarial assumptions and methods without performing a substantial amount of additional work beyond the scope of the assignment, and did not do so.

We recommend reviewing the current asset valuation method along with the economic assumptions (rate of inflation, investment return, payroll growth assumption) before the July 1, 2017, actuarial valuation.

### **Plan Asset Return**

On a market value basis, NDPERS assets had an investment return of approximately 0.46 percent (net of investment expenses). Recognition of deferred asset gains from fiscal years 2013 through 2015 were partially offset by recognition of the fiscal year end 2012 and 2016 investment losses (decrease in the fair value of investments). This recognition of asset gains and losses resulted in an estimated net asset rate of return of 6.59 percent on an actuarial value of assets basis, which compares to the assumed rate of return of 8.00 percent.

The actuarial value of assets is currently 93.8 percent of the market value of assets. There is \$153,695,443 in net asset gains currently being deferred that will be phased into the actuarial value of assets over the next four years.

### **Gain/Loss Analysis**

During the plan year ending June 30, 2016, the unfunded actuarial accrued liability ("UAAL") increased from \$958,195,183 as of July 1, 2015, to \$1,131,287,826 as of July 1, 2016, which is an increase of \$173,092,643. The key factors contributing to the increase in the UAAL were the statutory employer contributions to the Main System that were less than the actuarially determined employer contributions (and less than the employer normal cost plus interest on the unfunded liability), recognition of asset losses in the actuarial value of assets, and an increase in the UAAL due to differences in actuarial methods used by GRS to allocate future costs between the actuarial accrued

## COMMENTS ON THE ACTUARIAL VALUATION (CONTINUED)

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liability and future normal costs compared to the prior actuary. The unfunded actuarial accrued liability based on the market value of assets is \$981,669,810.

### **Funded Ratio**

The funded ratio measures the portion of the actuarial accrued liability (calculated based on the actuarial assumptions disclosed in this report) that is currently funded. The total PERS funded ratio is 66.7 percent on an actuarial value of assets basis and 71.1 percent on a market value of assets basis as of July 1, 2016.

The funded ratio for the Main System is 66.1 percent, the funded ratio for the Judges System is 104.3 percent, the funded ratio for the Law Enforcement with prior Main System service plan is 73.8 percent, and the funded ratio for the Law Enforcement without prior Main System service plan is 92.1 percent as of July 1, 2016. The funded ratios based on the market value of assets are approximately 4 to 6 percentage points higher than the funded ratios based on the actuarial value of assets.

The funded ratio and unfunded actuarial accrued liability are appropriate for assessing the need for and the amount of future unfunded liability contributions (excludes normal cost contributions). They are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the System's benefit obligations.

### **Employer Contributions**

The actuarially determined contribution rate is calculated as the normal cost contribution (to fund benefits accruing during the year) plus a contribution to amortize the unfunded liability. The unfunded liability contribution rate is calculated using a 20-year open period, level percentage of payroll amortization method. The remaining amortization period will be reset to 20 years in each future actuarial valuation. If employers contributed the actuarial contribution rate, the contribution rate would be expected to gradually decrease using a 20-year open amortization period as the funded ratio gradually increased. An open amortization period is expected to gradually improve the funded ratio. However, the funded ratio is not expected to reach 100 percent under this method (assuming no actuarial gains or losses) because the remaining unfunded liability at each future valuation date is re-amortized over a new 20-year period.

The contributions that are made by employers are based on fixed contribution rates that are set by statute (and not based on the actuarially determined rate). The statutory contribution rate is significantly lower than the actuarial contribution rate for the Main System, significantly higher than the actuarial contribution rate for Judges, and higher than the actuarial rate for the Law Enforcement Systems. Because the Main System comprises the majority of the liability and contribution requirement for the Combined System, the statutory contribution rate for the total PERS is also significantly lower than the actuarial contribution rate.

The portion of the statutory contribution that is applied toward the unfunded liability is the statutory contribution rate minus the employer normal cost rate. The unfunded liability contribution rate from the statutory contribution is significantly lower than the rate calculated using the 20-year level percentage of payroll amortization period. The statutory employer rate for the Main System is expected to amortize the current unfunded liability over a period of approximately 70 years based on the actuarial value of assets. Because the statutory employer rate is higher than the actuarial employer rate (based on a 20-year amortization period) for the Judges and Law Enforcement Systems, the statutory employer rate amortizes the unfunded liability over a period shorter than 20 years.

## COMMENTS ON THE ACTUARIAL VALUATION (CONTINUED)

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We recommend that after the asset smoothing method and economic assumptions are reviewed (and updated if appropriate), that the statutory contribution rate be reviewed and aligned with the actuarial employer contribution rate for all Plans. Based on the current actuarial valuation and the current actuarial assumptions and methods, the current statutory employer contribution rate for the Main System is not expected to amortize the unfunded liability over a reasonable period of time.

### **Historical Trends**

The funded ratio (based on the actuarial value of assets) for the total PERS has declined during the past 10 years from a high of 93.4 percent in 2007 to the current funded ratio of 66.7 percent.

## SUMMARY OF ACTUARIAL VALUATION RESULTS (TOTAL PERS)

		July 1, 2015 Results <sup>2</sup>	July 1, 2016 Results
<b>Membership</b>			
<b>Data</b>			
	Active Members	22,845	23,416
	Special Prior Service Members	3	3
	Inactive Vested and Non-Vested Members	9,503	10,733
	Retirees and Beneficiaries	10,094	10,515
	<b>TOTAL</b>	<b>42,445</b>	<b>44,667</b>
<b>Plan</b>			
<b>Liabilities</b>			
	Actuarial Accrued Liability:		
	Active Members	\$ 1,615,422,498	\$ 1,837,073,997
	Special Prior Service Members	1,074	1,040
	Inactive Vested and Non-Vested Members	173,604,582	212,315,346
	Retirees and Beneficiaries	1,263,418,385	1,347,175,084
	<b>TOTAL</b>	<b>\$ 3,052,446,539</b>	<b>\$ 3,396,565,467</b>
	Actuarial Value of Assets at Valuation Date	\$ 2,094,251,356	\$ 2,265,277,641
	Unfunded (Overfunded) Actuarial Accrued Liability	\$ 958,195,183	\$ 1,131,287,826
	<b>Funded Position of Plan's Actuarial Accrued Liability <sup>1</sup></b>	<b>68.6 %</b>	<b>66.7 %</b>
<b>Actuarial Contribution Requirement</b>		<b>Fiscal Year 2016 <sup>2</sup></b>	<b>Fiscal Year 2017</b>
	Annual Normal Cost as of Valuation Date	\$ 126,443,929	\$ 113,148,379
	Normal Cost Expense Load	2,448,847	2,626,622
	Amortization Payment	66,873,860	78,948,023
	<b>Total Actuarial Contribution Requirement</b>	<b>195,766,636</b>	<b>194,723,024</b>
	Expected Employee Contributions	71,430,469	78,158,824
	<b>Actuarial Employer Contribution Requirement</b>	<b>\$ 124,336,167</b>	<b>\$ 116,564,200</b>
	Projected Annual Compensation	\$ 1,024,155,919	\$ 1,122,879,138
<b>Actuarial Employer Contribution % of Projected Annual Compensation</b>			
	Main System	12.21%	10.48%
	Judges	10.75%	8.90%
	Law Enforcement with prior Main System service	9.78%	8.08%
	Law Enforcement without prior Main System service	8.03%	6.44%
	<b>Total PERS (Combined)</b>	<b>12.14%</b>	<b>10.38%</b>
<b>Statutory Employer Contribution % of Projected Annual Compensation</b>			
	Main System	7.12%	7.12%
	Judges	17.52%	17.52%
	Law Enforcement with prior Main System service	9.81%	9.81%
	Law Enforcement without prior Main System service	7.93%	7.93%
	<b>Total PERS (Combined)</b>	<b>7.25%</b>	<b>7.27%</b>

<sup>1</sup> Equals the ratio of the actuarial value of assets to the total actuarial accrued liability.

<sup>2</sup> Results reported by the prior actuary.

## CONTRIBUTION RATE BY PLAN ALL PERS PLANS

	Main System			Judges			Law Enforcement with prior Main System service		
	July 1, 2016	July 1, 2015**	Change	July 1, 2016	July 1, 2015**	Change	July 1, 2016	July 1, 2015**	Change
Actuarial Employer Contribution Requirement (\$)	\$ 112,981,892	\$ 121,358,455	\$ (8,376,563)	\$ 734,399	\$ 781,713	\$ (47,314)	\$ 2,514,672	\$ 1,828,196	\$ 686,476
<b>Actuarial Employer Contribution Requirement (% of Payroll)</b>									
Employer Normal Cost Contribution Requirement	3.24%	5.55%	-2.31%	10.40%	10.34%	0.06%	4.92%	6.43%	-1.51%
Employer UAL Contribution Requirement	7.24%	6.66%	0.58%	-1.50%	0.41%	-1.91%	3.16%	3.35%	-0.19%
Total Actuarial Employer Contribution Requirement (%)	10.48%	12.21%	-1.73%	8.90%	10.75%	-1.85%	8.08%	9.78%	-1.70%
Actuarial Employer Contribution Rate	10.48%	12.21%	-1.73%	8.90%	10.75%	-1.85%	8.08%	9.78%	-1.70%
Statutory Employer Contribution Rate	7.12%	7.12%	0.00%	17.52%	17.52%	0.00%	9.81%	9.81%	0.00%
Statutory Rate Deficit/(Surplus) Compared to Actuarial Rate	3.36%	5.09%	-1.73%	-8.62%	-6.77%	-1.85%	-1.73%	-0.03%	-1.70%
Employer UAL Contribution from Statutory Rate	3.88%	1.57%	2.31%	7.12%	7.18%	-0.06%	4.89%	3.38%	1.51%
Amortization Period from Statutory Rate (Years)	69.9	Infinite*	NA	None	0.8	NA	11.3	19.6	(8.3)
Actuarial Value of Assets (AVA)	\$ 2,180,748,616	\$ 2,027,476,214	\$ 153,272,402	\$ 41,526,834	\$ 38,973,906	\$ 2,552,928	\$ 39,779,332	\$ 25,335,386	\$ 14,443,946
Market Value of Assets (MVA)	2,324,783,623	2,296,088,880	28,694,743	44,269,616	44,137,412	132,204	42,406,694	28,691,976	13,714,718
AVA Unfunded Liability	1,118,632,484	948,595,594	170,036,890	(1,707,391)	407,537	(2,114,928)	14,085,816	8,982,396	5,103,420
MVA Unfunded Liability	974,597,477	679,982,928	294,614,549	(4,450,173)	(4,755,969)	305,796	11,458,454	5,625,806	5,832,648
AVA Funded Ratio	66.1%	68.1%	-2.0%	104.3%	99.0%	5.3%	73.8%	73.8%	0.0%
MVA Funded Ratio	70.5%	77.2%	-6.7%	111.2%	112.1%	-0.9%	78.7%	83.6%	-4.9%
Market Value Actuarial Employer Contribution Rate	9.55%	10.33%	-0.78%	6.48%	5.59%	0.89%	7.49%	8.53%	-1.04%
<b>Law Enforcement without prior Main System service</b>									
<b>Combined Main System, Judges and Law Enforcement</b>									
	July 1, 2016	July 1, 2015**	Change	July 1, 2016	July 1, 2015**	Change			
Actuarial Employer Contribution Requirement (\$)	\$ 333,237	\$ 367,803	\$ (34,566)	\$ 116,564,200	\$ 124,336,167	\$ (7,771,967)			
<b>Actuarial Employer Contribution Requirement (% of Payroll)</b>									
Employer Normal Cost Contribution Requirement	6.07%	7.71%	-1.64%	3.35%	5.61%	-2.26%			
Employer UAL Contribution Requirement	0.37%	0.32%	0.05%	7.03%	6.53%	0.50%			
Total Actuarial Employer Contribution Requirement (%)	6.44%	8.03%	-1.59%	10.38%	12.14%	-1.76%			
Actuarial Employer Contribution Rate	6.44%	8.03%	-1.59%	10.38%	12.14%	-1.76%			
Statutory Employer Contribution Rate	7.93%	7.93%	0.00%	7.27%	7.25%	0.02%			
Statutory Rate Deficit/(Surplus) Compared to Actuarial Rate	-1.49%	0.10%	-1.59%	3.11%	4.89%	-1.78%			
Employer UAL Contribution from Statutory Rate	1.86%	0.22%	1.64%	3.92%	1.64%	2.28%			
Amortization Period from Statutory Rate (Years)	3.1	Infinite*	NA	60.7	Infinite*	NA			
Actuarial Value of Assets (AVA)	\$ 3,222,859	\$ 2,465,850	\$ 757,009	\$ 2,265,277,641	\$ 2,094,251,356	\$ 171,026,285			
Market Value of Assets (MVA)	3,435,724	2,792,541	643,183	2,414,895,657	2,371,710,809	43,184,848			
AVA Unfunded Liability	276,917	209,656	67,261	1,131,287,826	958,195,183	173,092,643			
MVA Unfunded Liability	64,052	(117,035)	181,087	981,669,810	680,735,730	300,934,080			
AVA Funded Ratio	92.1%	92.2%	-0.1%	66.7%	68.6%	-1.9%			
MVA Funded Ratio	98.2%	104.4%	-6.2%	71.1%	77.7%	-6.6%			
Market Value Actuarial Employer Contribution Rate	6.16%	7.53%	-1.37%	9.45%	5.61%	3.84%			

\*The unfunded liability contribution rate from the statutory contribution rate is not high enough to amortize the unfunded liability over any period of time.

\*\* Results reported by the prior actuary.

# ACTUARIAL VALUATION RESULTS

## ALL PERS PLANS

	Valuation as of July 1, 2016								July 1, 2015			
	Main System	%	Judges	%	Law Enforcement w/ Prior	%	Law Enforcement w/o Prior	%	Total	% of Payroll	Total <sup>2</sup>	% of Payroll
<b>Active Members</b>												
Number	22,762		56		498		100		23,416		22,845	
Average Age	46.5		57.4		37.3		37.6		46.3		46.4	
Average Years of Benefit Service	9.6		10.4		6.6		3.7		9.6		9.6	
Average Years of Vesting Service	9.7		15.5		7.4		4.4		9.7		9.7	
Total Payroll	\$ 1,007,764,043		\$ 7,937,062		\$ 28,225,868		\$ 4,621,494		\$ 1,048,548,467		\$ 961,690,526	
Projected Annual Compensation	\$ 1,078,313,236		\$ 8,254,545		\$ 31,135,902		\$ 5,175,456		\$ 1,122,879,138		\$ 1,024,155,919	
<b>Special Prior Service Members</b>												
Number	3		-		-		-		3		3	
Total Benefits	\$ 377		\$ -		\$ -		\$ -		\$ 377		\$ 377	
<b>Inactive Vested and Non-Vested Members</b>												
Number	10,460		4		206		63		10,733		9,503	
Total Benefits	\$ 31,414,596		\$ 141,972		\$ 671,947		\$ 79,010		\$ 32,307,525		\$ 22,761,286	
<b>Retired Members and Beneficiaries</b>												
Number	10,391		43		79		2		10,515		10,094	
Total Benefits	\$ 139,645,622		\$ 2,121,768		\$ 1,445,651		\$ 13,056		\$ 143,226,097		\$ 135,701,219	
Total Membership	43,616		103		783		165		44,667		42,445	
<b>Actuarial Accrued Liability</b>												
Active Members	\$ 1,781,031,909		\$ 18,669,643		\$ 34,515,459		\$ 2,856,986		\$ 1,837,073,997		\$ 1,615,422,498	
Special Prior Service Members	1,040		-		-		-		1,040		1,074	
Inactive Vested and Non-Vested Members	206,410,703		1,090,590		4,300,258		513,795		212,315,346		173,604,582	
Retired Members and Beneficiaries	1,311,937,448		20,059,210		15,049,431		128,995		1,347,175,084		1,263,418,385	
Total	3,299,381,100		39,819,443		53,865,148		3,499,776		3,396,565,467		3,052,446,539	
Actuarial Value of Assets	\$ 2,180,748,616		\$ 41,526,834		\$ 39,779,332		\$ 3,222,859		\$ 2,265,277,641		\$ 2,094,251,356	
Unfunded Actuarial Accrued Liability	\$ 1,118,632,484		\$ (1,707,391)		\$ 14,085,816		\$ 276,917		\$ 1,131,287,826		\$ 958,195,183	
Funded Ratio (Actuarial Value of Assets)	66.1%		104.3%		73.8%		92.1%		66.7%		68.6%	
<b>Annual Gross Normal Cost</b>												
Benefits	\$ 107,826,127	(10.00%)	\$ 1,506,688	(18.25%)	\$ 3,224,989	(10.36%)	\$ 590,575	(11.41%)	\$ 113,148,379	(10.08%)	\$ 126,443,929	(12.35%)
Expenses of Administration	2,568,029	(0.24%)	12,094	(0.15%)	38,513	(0.12%)	7,986	(0.16%)	2,626,622	(0.23%)	2,448,847	(0.24%)
Total	110,394,156	(10.24%)	1,518,782	(18.40%)	3,263,502	(10.48%)	598,561	(11.57%)	115,775,001	(10.31%)	128,892,776	(12.59%)
Amortization of Unfunded Liability <sup>1</sup>	\$ 78,069,663	(7.24%)	\$ (124,019)	(-1.50%)	\$ 983,053	(3.16%)	\$ 19,326	(0.37%)	\$ 78,948,023	(7.03%)	\$ 66,873,860	(6.53%)
<b>Actuarial Contribution Requirement</b>												
Employer Portion	\$ 112,981,892	(10.48%)	\$ 734,399	(8.90%)	\$ 2,514,672	(8.08%)	\$ 333,237	(6.44%)	\$ 116,564,200	(10.38%)	\$ 124,336,167	(12.14%)
Employee Portion	75,481,927	(7.00%)	660,364	(8.00%)	1,731,883	(5.56%)	284,650	(5.50%)	78,158,824	(6.96%)	71,430,469	(6.97%)
Total	188,463,819	(17.48%)	1,394,763	(16.90%)	4,246,555	(13.64%)	617,887	(11.94%)	194,723,024	(17.34%)	195,766,636	(19.12%)
Actuarial Contribution	\$ 112,981,892	(10.48%)	\$ 734,399	(8.90%)	\$ 2,514,672	(8.08%)	\$ 333,237	(6.44%)	\$ 116,564,200	(10.38%)	\$ 124,336,167	(12.14%)
Statutory Employer Contribution	76,775,902	(7.12%)	1,446,196	(17.52%)	3,054,432	(9.81%)	410,414	(7.93%)	81,686,944	(7.27%)	74,251,304	(7.25%)
Statutory Contribution Deficit/(Surplus)	36,205,990	(3.36%)	(711,797)	(-8.62%)	(539,760)	(-1.73%)	(77,177)	(-1.49%)	34,877,256	(3.11%)	50,084,863	(4.89%)

<sup>1</sup> Amortization as a level percentage of payroll over a 20-year open period. Total payroll assumed to increase by 4.00% annually for the Judges and 4.50% for the Main System and Law Enforcement groups.

<sup>2</sup> Results reported by the prior actuary.

# ACTUARIAL VALUATION RESULTS

## GAIN/LOSS ANALYSIS

### RECONCILIATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

	Main System	Judges	Law Enforcement with Prior Main System service	Law Enforcement without Prior Main System service	Total
Unfunded liability at previous valuation	\$ 948,595,594	\$ 407,537	\$ 8,982,396	\$ 209,656	\$ 958,195,183
Unfunded liability at previous valuation - GRS replication results	1,056,939,932	(372,669)	9,461,676	305,662	1,066,334,601
<u>Expected unfunded liability at current valuation</u>					
Normal cost for plan year <sup>1</sup>	103,608,361	1,366,793	1,961,430	533,646	107,470,230
Interest on unfunded liability and normal cost <sup>1</sup>	88,619,801	23,806	833,882	45,388	89,522,877
Contributions using actuarial rate with interest to current valuation date <sup>1</sup>	184,330,892	1,392,282	2,724,616	576,750	189,024,540
Total expected change in unfunded liability at current valuation <sup>1</sup>	7,897,270	(1,683)	70,696	2,284	7,968,567
Total expected unfunded liability at current valuation	1,064,837,202	(374,352)	9,532,372	307,946	1,074,303,168
Change due to:					
Amount and timing of contributions (based on statutory rate)	33,686,864	(672,994)	(1,148,269)	(75,440)	31,790,161
Amount and timing of administrative expenses	84,327	131	7,658	326	92,442
Recognition of asset (gains)/losses	14,659,356	482,468	1,655,823	93,070	16,890,717
Salary experience	(42,485,719)	(120,993)	1,178,788	11,506	(41,416,418)
Retirement experience	(2,559,270)	(535,764)	(148,714)	(6,177)	(3,249,925)
Withdrawal experience	(1,270,432)	(6,972)	107,787	(31,220)	(1,200,837)
Disability experience	139,652	(19,505)	56,586	(3,282)	173,451
Death in Service experience	(306,953)	(41,050)	(266)	381	(347,888)
Death After Retirement experience	(799,983)	(793,090)	(340,274)	(52,788)	(1,986,135)
New entrants <sup>2</sup>	54,046,549	165,148	2,383,870	64,328	56,659,895
Data changes and other experience	(1,399,109)	209,582	800,455	(31,733)	(420,805)
Change in actuarial assumptions	-	-	-	-	-
Changes in plan provisions	-	-	-	-	-
Total change	53,795,282	(1,333,039)	4,553,444	(31,029)	56,984,658
Unfunded liability at current valuation	\$ 1,118,632,484	\$ (1,707,391)	\$ 14,085,816	\$ 276,917	\$ 1,131,287,826

### RECONCILIATION OF ACTUARIAL CONTRIBUTION RATE

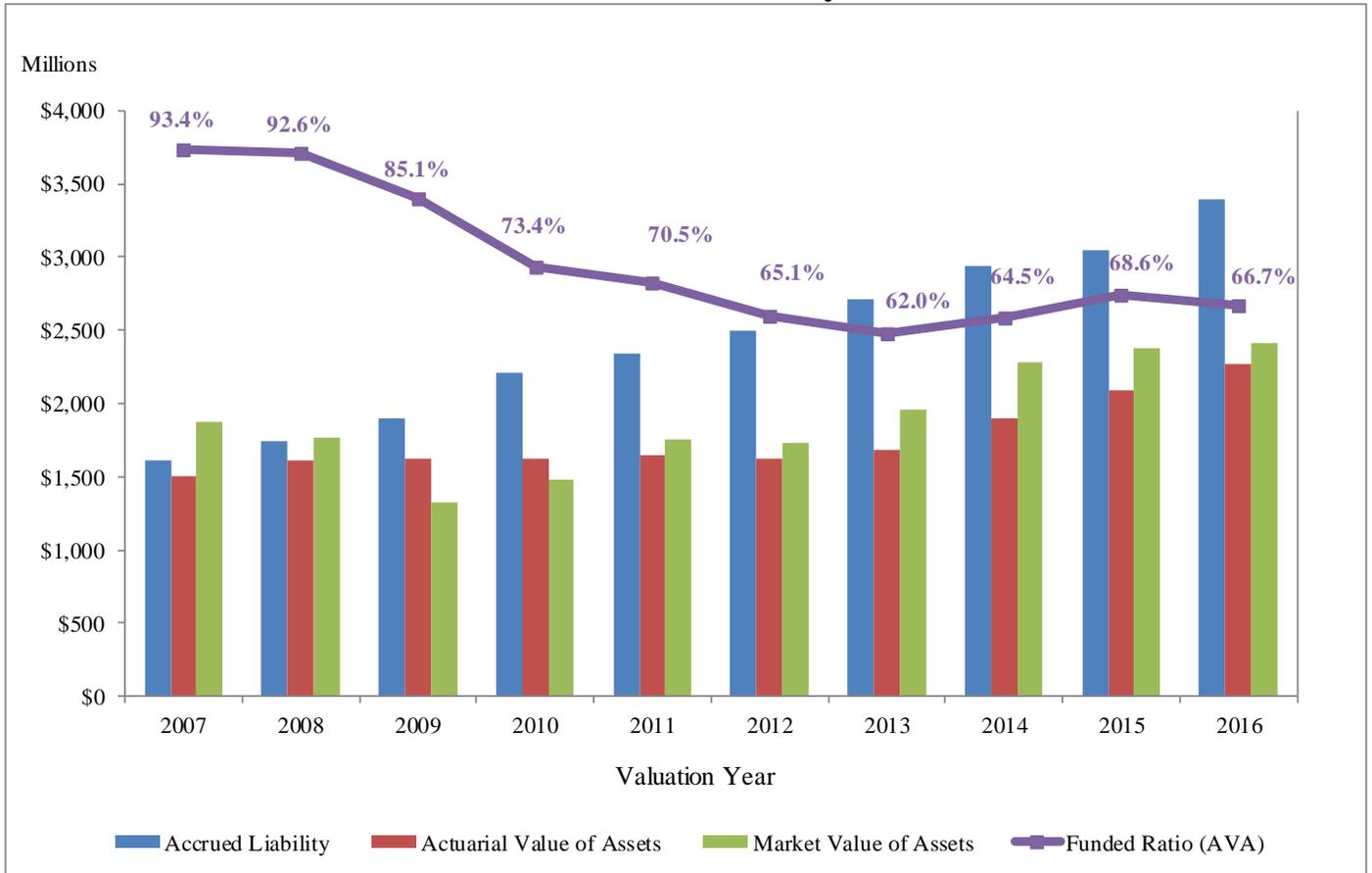
	Main System	Judges	Law Enforcement with Prior Main System service	Law Enforcement without Prior Main System service
FY 2016 Actuarial Employer Contribution	12.21%	10.75%	9.78%	8.03%
GRS Replication Results FY 2016 Actuarial Employer Contribution	10.76%	10.40%	8.67%	6.52%
Expected FY 2017 Actuarial Employer Contribution	10.49%	10.42%	8.51%	6.51%
Change due to:				
Amount and timing of contributions (based on statutory rate)	0.22%	-0.65%	-0.42%	-0.11%
Amount and timing of administrative expenses	0.01%	0.00%	0.05%	0.00%
Recognition of asset (gains)/losses	0.10%	0.47%	0.59%	0.14%
Salary experience	-0.31%	-0.12%	0.29%	0.03%
Retirement experience	-0.02%	-0.52%	-0.05%	-0.01%
Withdrawal experience	-0.01%	-0.01%	0.04%	-0.04%
Disability experience	0.00%	-0.02%	0.02%	-0.01%
Death in Service experience	0.00%	-0.04%	0.00%	0.00%
Death After Retirement experience	-0.01%	-0.76%	-0.12%	-0.08%
New entrants <sup>2</sup>	0.02%	-0.06%	-1.01%	0.05%
Data changes and other experience	-0.01%	0.19%	0.18%	-0.04%
Change in actuarial assumptions	0.00%	0.00%	0.00%	0.00%
Changes in plan provisions	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Total change	-0.01%	-1.52%	-0.43%	-0.07%
FY 2017 Actuarial Employer Contribution	10.48%	8.90%	8.08%	6.44%
FY 2017 Statutory Employer Contribution	7.12%	17.52%	9.81%	7.93%

<sup>1</sup> Based on GRS replication results.

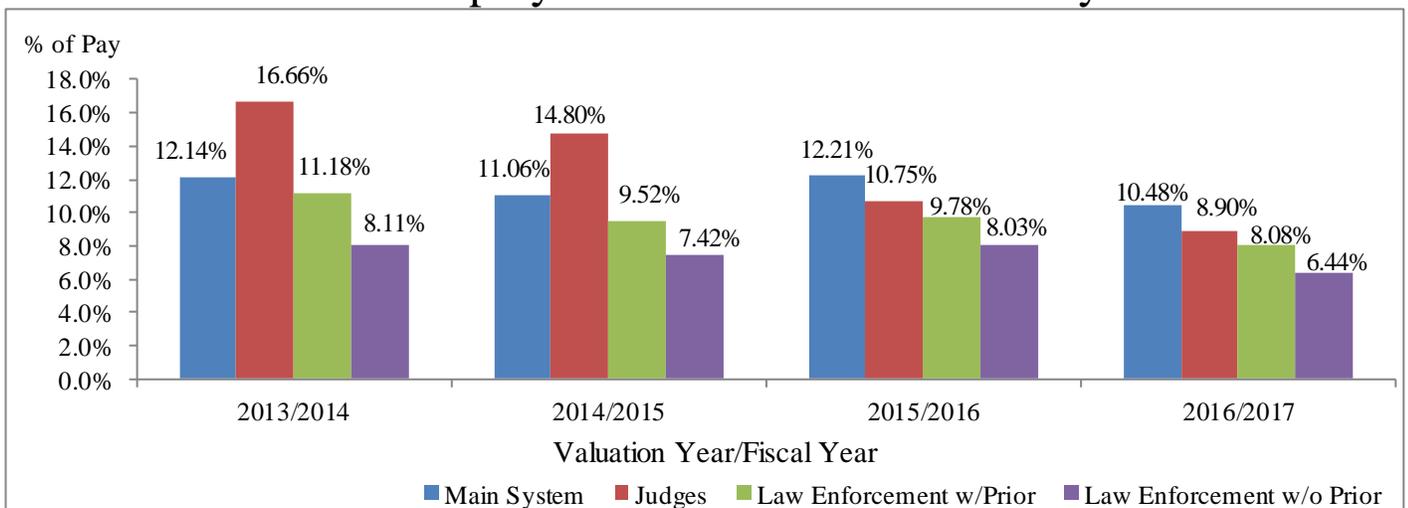
<sup>2</sup> New entrants change includes the net impact of liability and asset transfers.

# HISTORICAL TRENDS OF FUNDED RATIO AND EMPLOYER CONTRIBUTIONS

## Funded Ratio History



## Actuarial Employer Contribution Rate History



Values prior to July 1, 2016, were calculated by the prior actuary.

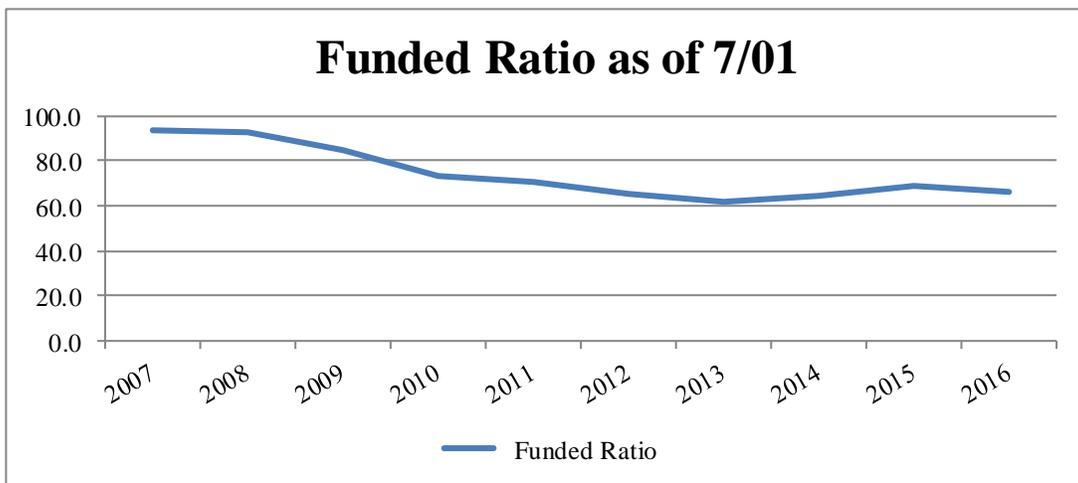
**ACTUARIAL VALUATION RESULTS  
SOLVENCY TEST (\$ IN MILLIONS)**

Valuation Date	Total Actuarial Accrued Liability	(1)	(2)	(3)	Actuarial Value of Assets	Portion (%) of Actuarial Accrued Liability By Assets		
		Active Member Contributions	Retirees, Beneficiaries, and Inactive Members	Active Members (Employer Financed Portion)		(1)	(2)	(3)
2007	\$1,609.2	\$433.7	\$611.3	\$565.2	\$1,503.1	100%	100%	81%
2008	1,737.6	468.1	655.7	613.8	1,609.8	100%	100%	79%
2009	1,901.2	507.6	728.1	665.5	1,617.1	100%	100%	57%
2010	2,208.4	600.5	822.2	785.7	1,621.7	100%	100%	25%
2011	2,339.8	588.3	908.3	843.2	1,650.5	100%	100%	18%
2012	2,501.3	626.2	1,070.7	804.4	1,627.4	100%	94%	0%
2013	2,716.5	687.9	1,126.0	902.6	1,683.0	100%	88%	0%
2014	2,938.8	746.5	1,255.4	936.9	1,895.8	100%	92%	0%
2015	3,052.4	788.3	1,437.0	827.1	2,094.3	100%	91%	0%
2016	3,396.6	879.3	1,559.5	957.8	2,265.3	100%	89%	0%

*Values prior to July 1, 2016, were calculated by the prior actuary.*

## FUNDED RATIO HISTORY

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)
07/01/2007	\$ 1,503,137,900	\$ 1,609,168,600	\$ 106,030,700	93.4 %
07/01/2008	1,609,810,300	1,737,627,000	127,816,700	92.6
07/01/2009	1,617,147,800	1,901,200,800	284,053,000	85.1
07/01/2010	1,621,723,100	2,208,386,100	586,663,000	73.4
07/01/2011	1,650,463,700	2,339,833,200	689,369,500	70.5
07/01/2012	1,627,395,600	2,501,331,500	873,935,900	65.1
07/01/2013	1,682,958,500	2,716,494,800	1,033,536,300	62.0
07/01/2014	1,895,837,700	2,938,752,200	1,042,914,500	64.5
07/01/2015	2,094,251,400	3,052,446,500	958,195,100	68.6
07/01/2016	2,265,277,641	3,396,565,467	1,131,287,826	66.7



*Values prior to July 1, 2016, were calculated by the prior actuary and rounded to the nearest \$100.*

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**SECTION B**  
ASSET EXHIBITS

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## STATEMENT OF FIDUCIARY NET POSITION

Assets	Fiscal Year Ending					
	June 30, 2015			June 30, 2016		
	PERS	Highway Patrol	Total	PERS	Highway Patrol	Total
Cash	\$ 7,700,778	\$ -	\$ 7,700,778	\$ 9,317,857	\$ -	\$ 9,317,857
Receivables						
Contribution receivable	10,097,551	30	10,097,581	12,753,464	560	12,754,024
Interest receivable	4,462,618	126,209	4,588,827	5,765,507	158,350	5,923,857
Due from other fiduciary funds	205,726	0	205,726	309,308	25,479	334,787
Due from Uniform Group Insurance Plan		0	0		0	0
Due from other state agencies	460	0	460	0	0	0
Total receivables	<u>14,766,355</u>	<u>126,239</u>	<u>14,892,594</u>	<u>18,828,279</u>	<u>184,389</u>	<u>19,012,668</u>
Investments						
Equities	1,263,057,765	35,752,212	1,298,809,977	1,278,735,642	35,144,183	1,313,879,825
Fixed income	544,120,975	15,401,931	559,522,906	546,274,647	15,013,562	561,288,209
Real estate	418,669,456	11,850,891	430,520,347	447,464,886	12,297,919	459,762,805
Mutual funds	-	-	-	-	-	-
Annuities	-	-	-	-	-	-
Alternative investments	86,518,762	2,449,007	88,967,769	77,800,359	2,138,229	79,938,588
Invested cash	39,067,851	1,105,858	40,173,709	37,566,289	1,032,455	38,598,744
Total Investments	<u>2,351,434,809</u>	<u>66,559,899</u>	<u>2,417,994,708</u>	<u>2,387,841,823</u>	<u>65,626,348</u>	<u>2,453,468,171</u>
Prepaid expenses	276	-	276	-	-	-
Invested Securities Lending Collateral	-	-	-	24,042,640	660,777	24,703,417
Capital assets (net of depreciation/ amortization)	2,043,278	17,900	2,061,178	1,691,598	15,163	1,706,761
Total assets	<u>2,375,945,496</u>	<u>66,704,038</u>	<u>2,442,649,534</u>	<u>2,441,722,197</u>	<u>66,486,677</u>	<u>2,508,208,874</u>
<b>Liabilities</b>						
Salaries payable	91,535	-	91,535	103,819	-	103,819
Accounts payable	4,012,487	30	4,012,517	2,520,453	559	2,521,012
Due to other fiduciary funds	1,878	28,280	30,158	25,861	14,004	39,865
Due to Uniform Group Insurance Plan	19,029	-	19,029	13,325	-	13,325
Securities Lending Collateral				24,042,640	660,777	24,703,417
Due to other state agencies	13,346	-	13,346	11,713	-	11,713
Accrued compensated absences	96,412	-	96,412	108,729	-	108,729
Total liabilities	<u>4,234,687</u>	<u>28,310</u>	<u>4,262,997</u>	<u>26,826,540</u>	<u>675,340</u>	<u>27,501,880</u>
<b>Net position restricted for pensions</b>	<u>\$ 2,371,710,809</u>	<u>\$ 66,675,728</u>	<u>\$ 2,438,386,537</u>	<u>\$ 2,414,895,657</u>	<u>\$ 65,811,337</u>	<u>\$ 2,480,706,994</u>

**STATEMENT OF CHANGES IN FIDUCIARY NET POSITION**  
**TOTAL PUBLIC EMPLOYEES RETIREMENT SYSTEM (PERS) AND HIGHWAY PATROLMEN'S**  
**RETIREMENT SYSTEM (HPRS)**

	Fiscal Year Ending					
	June 30, 2015			June 30, 2016		
	PERS	Highway Patrol	Total	PERS	Highway Patrol	Total
<b>Additions</b>						
Contributions:						
From employer	\$ 70,842,535	\$ 2,002,291	\$ 72,844,826	\$ 77,080,576	\$ 2,127,355	\$ 79,207,931
From employee	68,392,061	1,351,798	69,743,859	74,218,276	1,436,236	75,654,512
Transfer from general fund	-	-	-	1,890	-	1,890
Transfers from other plans	-	-	-	23,573,047	-	23,573,047
Total contributions	139,234,596	3,354,089	142,588,685	174,873,789	3,563,591	178,437,380
Investment income:						
Net change in fair value of investments	44,887,622	1,287,164	46,174,786	(38,325,802)	(1,073,991)	(39,399,793)
Interest and dividends	44,597,780	1,278,179	45,875,959	56,512,739	1,583,045	58,095,784
Less investment expense	(7,948,837)	(230,563)	(8,179,400)	(7,132,911)	(199,955)	(7,332,866)
Net investment income	81,536,565	2,334,780	83,871,345	11,054,026	309,099	11,363,125
Securities Lending Income	-	-	-	279,098	7,859	286,957
Repurchase service credit	6,651,879	96,429	6,748,308	9,179,163	-	9,179,163
Miscellaneous income	-	-	-	712	5	717
Total additions	227,423,040	5,785,298	233,208,338	195,386,788	3,880,554	199,267,342
<b>Deductions</b>						
Benefits paid to participants	127,179,525	4,528,178	131,707,703	141,263,796	4,658,232	145,922,028
Refunds	7,217,565	217,332	7,434,897	8,001,696	55,263	8,056,959
Transfers to other plans	532,647	-	532,647	398,649	-	398,649
Administrative expenses	134,929,737	4,745,510	139,675,247	149,664,141	4,713,495	154,377,636
	2,365,357	30,925	2,396,282	2,537,799	31,450	2,569,249
Total deductions	137,295,094	4,776,435	142,071,529	152,201,940	4,744,945	156,946,885
Change in net position	90,127,946	1,008,863	91,136,809	43,184,848	(864,391)	42,320,457
<b>Net position restricted for pensions</b>						
Beginning of year	2,281,582,863	65,666,865	2,347,249,728	2,371,710,809	66,675,728	2,438,386,537
End of year	\$ 2,371,710,809	\$ 66,675,728	\$ 2,438,386,537	\$ 2,414,895,657	\$ 65,811,337	\$ 2,480,706,994

## MARKET VALUE OF ASSETS BY PLAN (PERS)

	Fiscal Year Ending									
	June 30, 2015					June 30, 2016				
	Main System	Judges	Law Enforcement with Prior Main System service	Law Enforcement without Prior Main System service	Total PERS	Main System	Judges	Law Enforcement with Prior Main System service	Law Enforcement without Prior Main System service	Total PERS
<b>Additions</b>										
Contributions:										
From employer	\$ 67,669,373	\$ 1,225,358	\$ 1,638,385	\$ 309,419	\$ 70,842,535	\$ 72,960,488	\$ 1,364,327	\$ 2,384,097	\$ 371,664	\$ 77,080,576
From employee	66,688,488	559,524	928,984	215,065	68,392,061	71,996,797	622,985	1,342,588	255,906	74,218,276
Transfer from general fund	-	-	-	-	-	1,890	-	-	-	1,890
Transfers from other plans	(1,689,670)	-	1,689,670	-	-	12,241,447	-	11,331,600	-	23,573,047
Total contributions	132,668,191	1,784,882	4,257,039	524,484	139,234,596	157,200,622	1,987,312	15,058,285	627,570	174,873,789
Investment income:	78,945,836	1,532,170	971,657	86,902	81,536,565	10,654,377	211,606	173,027	15,016	11,054,026
Securities Lending Income	-	-	-	-	-	279,098	-	-	-	279,098
Repurchase service credit	6,434,176	143,800	67,519	6,384	6,651,879	8,905,606	111,586	98,463	63,508	9,179,163
Miscellaneous income	-	-	-	-	-	712	-	-	-	712
Total additions	218,048,203	3,460,852	5,296,215	617,770	227,423,040	177,040,415	2,310,504	15,329,775	706,094	195,386,788
<b>Deductions</b>										
Total Benefits, Refunds and Transfers	131,499,520	2,025,907	1,381,914	22,396	134,929,737	145,864,485	2,166,615	1,577,846	55,195	149,664,141
Administrative expenses	2,318,204	11,168	28,834	7,151	2,365,357	2,481,187	11,685	37,211	7,716	2,537,799
Total deductions	133,817,724	2,037,075	1,410,748	29,547	137,295,094	148,345,672	2,178,300	1,615,057	62,911	152,201,940
Change in net position	84,230,479	1,423,777	3,885,467	588,223	90,127,946	28,694,743	132,204	13,714,718	643,183	43,184,848
<b>Net position restricted for pensions</b>										
Beginning of year	2,211,858,401	42,713,635	24,806,509	2,204,318	2,281,582,863	2,296,088,880	44,137,412	28,691,976	2,792,541	2,371,710,809
End of year	\$ 2,296,088,880	\$ 44,137,412	\$ 28,691,976	\$ 2,792,541	\$ 2,371,710,809	\$ 2,324,783,623	\$ 44,269,616	\$ 42,406,694	\$ 3,435,724	\$ 2,414,895,657

## DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS (TOTAL PERS AND HPRS)

Fiscal Year Ending	2015	2016	2017	2018	2019	2020
Beginning of Year:						
(1) Market Value of Assets	\$2,347,301,808	\$ 2,438,386,537				
(2) Actuarial Value of Assets	1,950,401,117	2,153,126,887				
End of Year:						
(3) Market Value of Assets	2,438,386,537	2,480,706,994				
(4a) Contributions and non-investment income	149,336,993	187,904,217				
(4b) Interest and Dividends	45,875,959	58,095,784				
(4c) Net Disbursements	142,071,529	156,946,885				
(4d) Investment Expense	8,179,400	7,332,866				
(4e) Net Cash Flow (Excl. change in fair value of investments)						
=(4a)+(4b)-(4c)-(4d)	44,962,023	81,720,250				
(5) Net change in fair value of investments						
=(3)-(1)-(4e)	46,174,786	(39,399,793)				
(6) Projected Rate of Return	8.00%	8.00%				
(7) Projected Investment Income						
=(1)x(6)+([1+(6)] <sup>n</sup> .5-1)x(4a-4c)	188,069,172	196,285,394				
(8) Asset Adjustment	(52,080)	0				
(9) Investment Income						
=(4b)-(4d)+(5)	83,871,345	11,363,125				
(10) Excess Investment Income Recognized						
This Year (5 year recognition)						
(10a) From This Year =20% x (5)	9,234,957	\$ (7,879,959)				
(10b) From One Year Ago	58,673,248	9,234,957	\$ (7,879,959)			
(10c) From Two Years Ago	40,163,910	58,673,248	9,234,957	\$ (7,879,959)		
(10d) From Three Years Ago	(8,027,742)	40,163,910	58,673,248	9,234,957	\$ (7,879,959)	
(10e) From Four Years Ago	57,771,454	(8,027,742)	40,163,909	58,673,249	9,234,957	\$ (7,879,957)
(10f) Total Recognized Investment Gain/(Loss)	157,815,827	92,164,414	100,192,155	60,028,247	1,354,998	(7,879,957)
(11) Change in Actuarial Value of Assets						
=(4e)+(8)+(10f)	202,725,770	173,884,664				
End of Year:						
<b>(3) Market Value of Assets</b>	<b>2,438,386,537</b>	<b>\$ 2,480,706,994</b>				
<b>(12) Final Actuarial Value of Assets as of 6/30 = (2)+(11)</b>	<b>2,153,126,887</b>	<b>\$ 2,327,011,551</b>				
(13) Difference Between Market & Actuarial Values	285,259,650	153,695,443				
(14) Estimated Market Value Rate of Return on Total Plan Assets	3.57%	0.46%				
(15) Actuarial Value Rate of Return	10.01%	6.59%				
(16) Ratio of Actuarial Value to Market Value	88.3%	93.8%				

## ACTUARIAL VALUE OF ASSETS BY PLAN (PERS AND HPRS)

Valuation as of July 1, 2016							
	Main System	Judges	Law Enforcement with Prior	Law Enforcement without Prior	Highway Patrol	Total	Total PERS
Market Value of Assets	\$ 2,324,783,623	\$ 44,269,616	\$ 42,406,694	\$ 3,435,724	\$ 65,811,337	\$ 2,480,706,994	\$ 2,414,895,657
% of Total	93.71%	1.78%	1.71%	0.14%	2.65%	100.00%	97.35%
Actuarial Value of Assets	\$ 2,180,748,616	\$ 41,526,834	\$ 39,779,332	\$ 3,222,859	\$ 61,733,910	\$ 2,327,011,551	\$ 2,265,277,641
% of Total	93.71%	1.78%	1.71%	0.14%	2.65%	100.00%	97.35%
Ratio of Actuarial Value to Market Value	93.80%	93.80%	93.80%	93.80%	93.80%	93.80%	93.80%
Difference between Market Value and Actuarial Value	\$ 144,035,007	\$ 2,742,782	\$ 2,627,362	\$ 212,865	\$ 4,077,427	\$ 153,695,443	\$ 149,618,016
Valuation as of July 1, 2015							
	Main System	Judges	Law Enforcement with Prior	Law Enforcement without Prior	Highway Patrol	Total	Total PERS
Market Value of Assets	\$ 2,296,088,880	\$ 44,137,412	\$ 28,691,976	\$ 2,792,541	\$ 66,675,728	\$ 2,438,386,537	\$ 2,371,710,809
% of Total	94.16%	1.81%	1.18%	0.11%	2.73%	100.00%	97.27%
Actuarial Value of Assets	\$ 2,027,476,214	\$ 38,973,906	\$ 25,335,386	\$ 2,465,850	\$ 58,875,531	\$ 2,153,126,887	\$ 2,094,251,356
% of Total	94.16%	1.81%	1.18%	0.11%	2.73%	100.00%	97.27%
Ratio of Actuarial Value to Market Value	88.30%	88.30%	88.30%	88.30%	88.30%	88.30%	88.30%
Difference between Market Value and Actuarial Value	\$ 268,612,666	\$ 5,163,506	\$ 3,356,590	\$ 326,691	\$ 7,800,197	\$ 285,259,650	\$ 277,459,453

*Market value of assets by plan provided by NDPERS Staff.*

*Actuarial value of assets by plan allocated based on the proportion of the market value of assets as of the valuation date.*

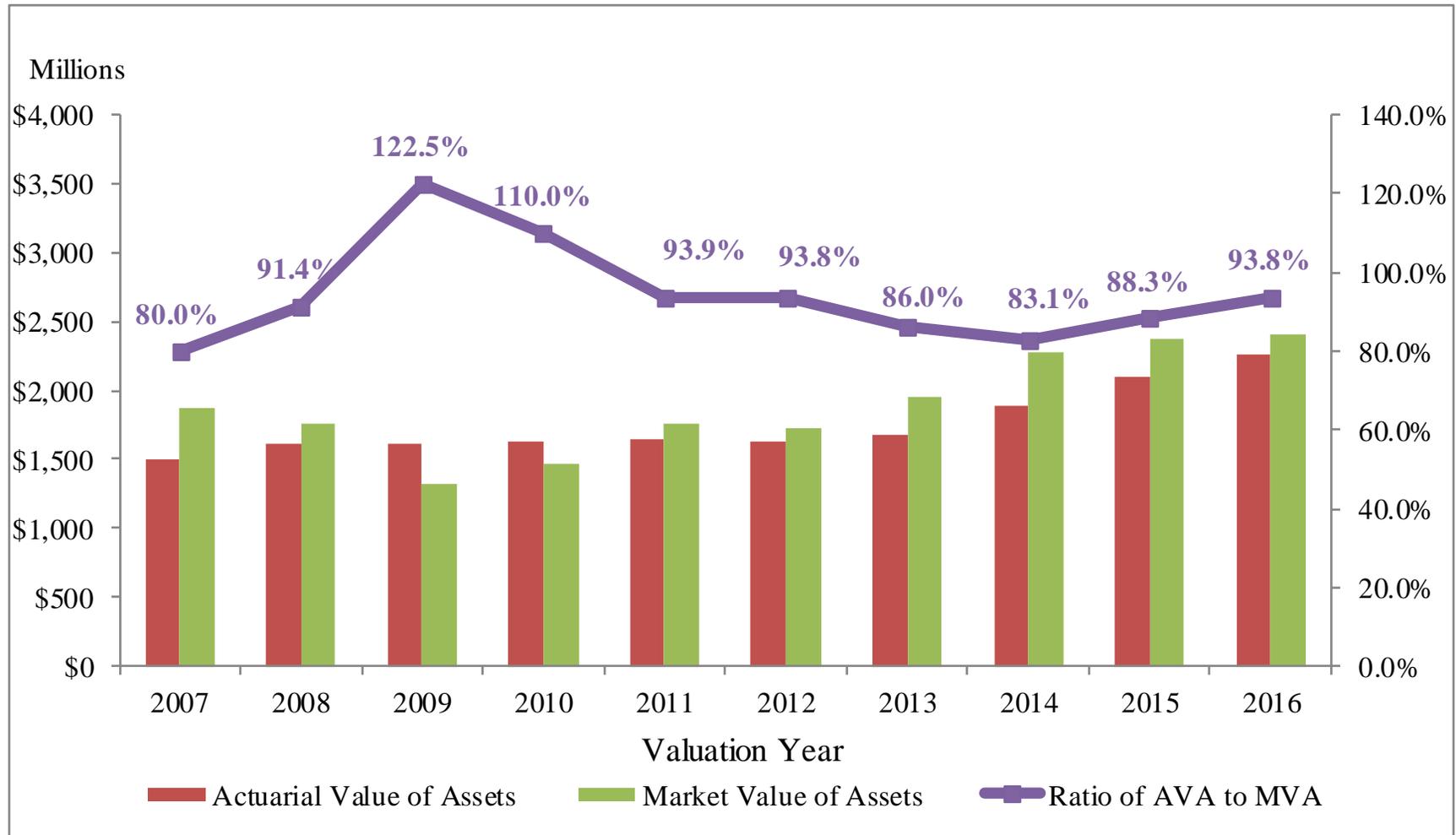
**CHANGES IN ACTUARIAL VALUE OF ASSETS  
(TOTAL PERS)**

<b>Date</b>	<b>Employer Contributions</b>	<b>Member Contributions<sup>1</sup></b>	<b>Transfers From/(To) Other Funds</b>	<b>Administrative Expenses</b>	<b>Benefit Payments and Refunds</b>	<b>Actuarial Value Investment Income</b>	<b>Actuarial Value of Assets at End of Year</b>	<b>Market Value of Assets at End of Year</b>
07/01/2007	\$23,140,767	\$25,562,617	(\$39,829)	(\$1,109,260)	(\$65,601,228)	\$206,643,922	\$1,503,139,894	\$1,878,924,867
07/01/2008	25,253,902	27,351,026	3,132,512	(1,118,233)	(74,938,198)	126,989,439	1,609,810,342	1,761,223,031
07/01/2009	27,705,267	29,970,355	(496,073)	(1,260,812)	(76,090,737)	27,509,459	1,617,147,801	1,320,003,286
07/01/2010	30,253,093	32,584,909	(210,638)	(1,214,733)	(80,827,104)	23,989,771	1,621,723,099	1,474,184,982
07/01/2011	32,278,056	34,277,035	(264,686)	(1,797,287)	(88,976,102)	53,223,596	1,650,463,711	1,758,056,598
07/01/2012	38,005,854	42,587,266	(412,993)	(1,856,915)	(98,968,562)	(2,422,725)	1,627,395,636	1,734,039,896
07/01/2013	48,846,796	54,285,278	(212,500)	(2,059,315)	(109,079,601)	63,782,233	1,682,958,527	1,957,670,026
07/01/2014	61,661,050	67,719,340	(347,783)	(2,158,712)	(119,538,541)	205,543,853	1,895,837,734	2,281,582,863
07/01/2015	70,842,535	75,043,940	(584,727)	(2,365,357)	(134,397,090)	189,874,321	2,094,251,356	2,371,710,809
07/01/2016	77,080,576	83,397,439	23,176,288	(2,537,799)	(149,265,492)	139,175,273	2,265,277,641	2,414,895,657
10-Year Total	435,067,896	472,779,205	23,739,571	(17,478,423)	(997,682,655)	1,034,309,142		

<sup>1</sup> Includes repurchases of service credit.

Values prior to July 1, 2016, were calculated by the prior actuary.

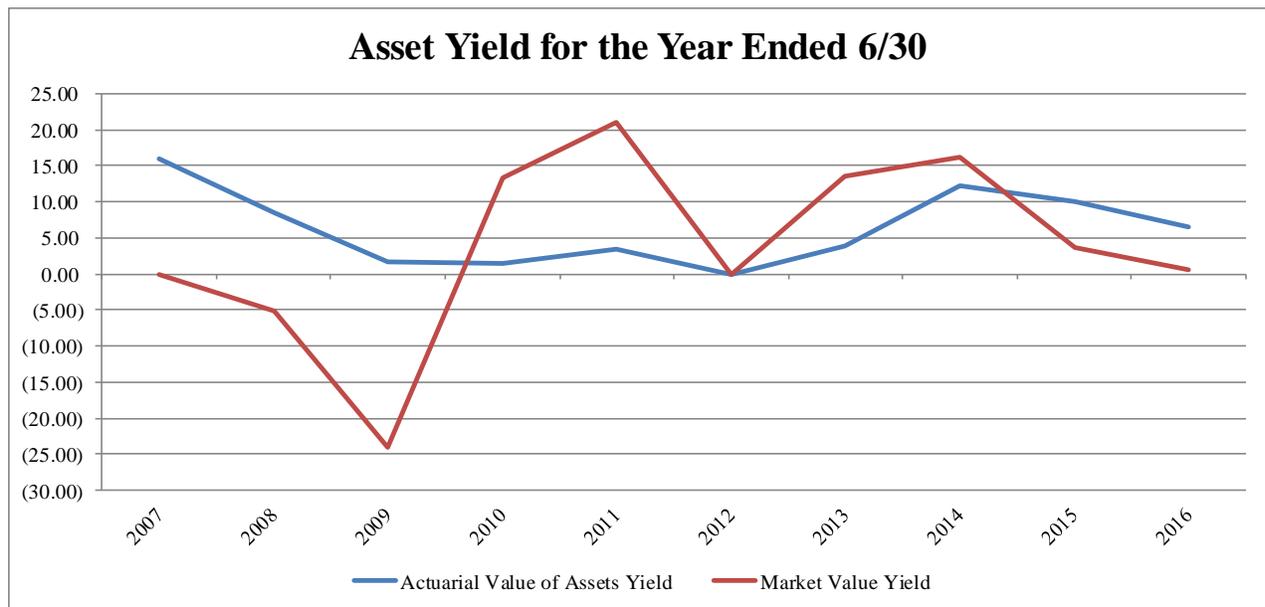
## HISTORICAL COMPARISON OF ACTUARIAL VALUE OF ASSETS TO MARKET VALUE OF ASSETS (TOTAL PERS)



*Values prior to July 1, 2016, were calculated by the prior actuary.*

## HISTORICAL COMPARISON OF TOTAL INVESTMENT INCOME (TOTAL PERS AND HPRS)

Actuarial Valuation Date	Net Interest and Dividend Income*		Other Income		Total Investment Income (Actuarial Assets Basis)		Total Investment Income (Market Value of Assets)
	Amount**	Yield	Amount**	Yield	Amount**	Yield	Yield
07/01/2007	\$ 34,727,000	2.58 %	\$ 178,771,700	13.26 %	\$ 213,498,700	15.84 %	19.63 %
07/01/2008	32,819,700	2.13	98,332,000	6.38	131,151,700	8.51	(5.21)
07/01/2009	29,260,400	1.77	(964,400)	(0.05)	28,296,000	1.72	(24.05)
07/01/2010	25,938,200	1.57	(1,337,500)	(0.09)	24,600,700	1.48	13.25
07/01/2011	28,830,100	1.74	26,013,200	1.57	54,843,300	3.31	21.09
07/01/2012	36,570,500	2.17	(39,020,800)	(2.32)	(2,450,300)	(0.15)	(0.20)
07/01/2013	37,884,500	2.27	27,803,800	1.66	65,688,300	3.93	13.41
07/01/2014	32,503,200	1.87	179,181,800	10.33	211,685,000	12.20	16.15
07/01/2015	37,696,600	1.93	157,815,800	8.08	195,512,400	10.01	3.57
07/01/2016	50,762,900	2.34	92,164,400	4.25	142,927,300	6.59	0.46
10-Year Total	346,993,100	2.04	718,760,000	4.31	1,065,753,100	6.34	4.27



\* Net interest and dividend income is net of investment expenses

\*\*Amount rounded to the nearest \$100

Values prior to July 1, 2016, were calculated by the prior actuary.

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**SECTION C**

ACTUARIAL VALUATION DATA

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## SUMMARY OF PARTICIPANT DATA (JULY 1, 2015 AND JULY 1, 2016)

Valuation as of July 1, 2016					
	Main System	Judges	Law Enforcement w/ Prior Service	Law Enforcement w/o Prior Service	Total
<b>Active Members</b>					
Number	22,762	56	498	100	23,416
Average Age	46.5	57.4	37.3	37.6	46.3
Average Vesting Service	9.6	10.4	6.6	3.7	9.6
Total Payroll	\$ 1,007,764,043	\$ 7,937,062	\$ 28,225,868	\$ 4,621,494	\$ 1,048,548,467
<b>Special Prior Service Pension Members</b>					
Number	3	-	-	-	3
Total Benefits	\$ 377	\$ -	\$ -	\$ -	\$ 377
<b>Inactive Members<sup>1</sup></b>					
Number	5,277	4	109	34	5,424
Total Benefits	\$ 31,355,538	\$ 141,972	\$ 671,947	\$ 79,010	\$ 32,248,466
<b>Inactive Members Elected Refunds<sup>1</sup></b>					
Number	5,153	-	96	28	5,277
Total Account Balance	\$ 15,369,015	\$ -	\$ 379,516	\$ 72,096	\$ 15,820,627
<b>LOA Deferred Vested Participants</b>					
Number	6	-	-	-	6
Total Account Balance	\$ 59,059	\$ -	\$ -	\$ -	\$ 59,059
<b>LOA Due Refunds</b>					
Number	24	-	1	1	26
Total Account Balance	\$ 215,515	\$ -	\$ 3,814	\$ 12,664	\$ 231,993
<b>Retired, Disabled, and Beneficiary Members</b>					
Number	10,391	43	79	2	10,515
Total Benefits	\$ 139,645,622	\$ 2,121,768	\$ 1,445,651	\$ 13,056	\$ 143,226,097
<b>Total Membership</b>	<b>43,616</b>	<b>103</b>	<b>783</b>	<b>165</b>	<b>44,667</b>

Valuation as of July 1, 2015					
	Main System	Judges	Law Enforcement w/ Prior Service	Law Enforcement w/o Prior Service	Total
<b>Active Members</b>					
Number	22,381	51	318	95	22,845
Average Age	46.5	58.7	37.1	37.8	46.4
Average Vesting Service	9.7	15.5	6.3	3.8	9.6
Total Payroll	N/A	N/A	N/A	N/A	N/A
Projected Annual Compensation	\$ 993,609,618	\$ 7,274,441	\$ 18,692,512	\$ 4,579,348	\$ 102,415,591
<b>Special Prior Service Pension Members</b>					
Number	3	-	-	-	3
Total Benefits	\$ 377	\$ -	\$ -	\$ -	\$ -
<b>Inactive Members (Vested and Non Vested)<sup>1</sup></b>					
Number	9,271	4	174	54	9,503
Total Benefits	NA	NA	NA	NA	NA
<b>Retired, Disabled, and Beneficiary Members</b>					
Number	9,976	44	73	1	10,046
Total Benefits	\$ 129,894,756	\$ 2,183,809	\$ 1,402,658	\$ 9,792	\$ 133,491,015
<b>Total Membership</b>	<b>41,631</b>	<b>99</b>	<b>565</b>	<b>150</b>	<b>42,397</b>

<sup>1</sup>Includes transferred members.

Values prior to July 1, 2016, were calculated by the prior actuary.

# AGE/SERVICE/SALARY BY GROUP AS OF JULY 1, 2016

## Main System

Total	Service as of Valuation Date									Totals	Valuation Payroll	Contribution Account Balance
	Current Age	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35 and Over			
Under 20	29	-	-	-	-	-	-	-	-	29	\$ 877,392	\$ 29,525
20-24	815	4	-	-	-	-	-	-	-	819	26,440,501	2,342,594
25-29	1,675	208	3	-	-	-	-	-	-	1,886	73,065,554	13,737,765
30-34	1,517	654	128	-	-	-	-	-	-	2,299	100,046,179	31,334,270
35-39	1,346	634	398	125	-	-	-	-	-	2,503	111,900,510	49,874,201
40-44	1,062	610	355	356	79	2	-	-	-	2,464	110,835,205	70,433,480
45-49	999	612	354	331	254	134	5	1	1	2,690	123,165,056	100,036,123
50-54	953	608	469	401	299	290	170	20	20	3,210	150,296,146	159,432,555
55-59	828	661	466	473	310	308	239	204	204	3,489	161,131,331	212,752,389
60-64	465	444	344	358	268	223	165	238	238	2,505	115,357,119	170,838,172
65-69	123	141	90	119	53	47	31	50	50	654	27,842,330	35,335,350
70-74	33	41	27	15	8	7	4	19	19	154	5,341,536	8,177,650
75 and Over	11	13	12	12	2	3	3	4	4	60	1,471,824	1,640,465
<b>Total</b>	<b>9,856</b>	<b>4,630</b>	<b>2,646</b>	<b>2,190</b>	<b>1,273</b>	<b>1,014</b>	<b>617</b>	<b>536</b>	<b>22,762</b>	<b>\$1,007,770,683</b>	<b>\$855,964,539</b>	

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

	Previous Valuation	Current Valuation	Change
Average Age:	46.5	46.5	(0.0)
Average Vesting Service:	9.7	9.6	(0.1)
Average Annual Pay <sup>1</sup> :	\$43,395	\$44,274	\$879
Average Account Balance:	\$34,576	\$37,605	\$3,029
Vested Participants	15,368	15,601	233
Nonvested Participants	7,013	7,161	148
Total Participants	22,381	22,762	381

Current Age	Annualized Salary as of Valuation Date										Totals
	Less Than \$20,000	\$20,000-\$29,999	\$30,000-\$39,999	\$40,000-\$49,999	\$50,000-\$59,999	\$60,000-\$69,999	\$70,000-\$79,999	\$80,000-\$89,999	\$90,000-\$99,999	\$100,000 & Over	
Under 20	2	14	9	2	2	-	-	-	-	-	29
20-24	65	306	245	150	47	5	1	-	-	-	819
25-29	127	423	478	450	284	100	15	5	2	2	1,886
30-34	147	358	515	551	400	172	87	44	10	15	2,299
35-39	214	418	461	493	447	238	102	61	41	28	2,503
40-44	218	402	474	493	365	227	129	75	40	41	2,464
45-49	249	450	474	531	424	229	141	79	41	72	2,690
50-54	244	501	637	681	444	297	155	91	66	94	3,210
55-59	249	620	732	652	474	337	178	91	49	107	3,489
60-64	226	415	512	458	363	223	109	71	49	79	2,505
65-69	103	115	133	108	88	46	17	13	12	19	654
70-74	46	32	22	24	11	8	5	3	-	3	154
75 and Over	28	16	9	4	3	-	-	-	-	-	60
<b>Total</b>	<b>1,918</b>	<b>4,070</b>	<b>4,701</b>	<b>4,597</b>	<b>3,352</b>	<b>1,882</b>	<b>939</b>	<b>533</b>	<b>310</b>	<b>460</b>	<b>22,762</b>

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

# AGE/SERVICE/SALARY BY GROUP AS OF JULY 1, 2016

## Judges

Total	Service as of Valuation Date								Totals	Valuation Payroll	Contribution Account Balance	
	Current Age	Under 5	5-9	10-14	15-19	20-24	25-29	30-34				35 and Over
Under 20	-	-	-	-	-	-	-	-	-	0	\$ -	\$ -
20-24	-	-	-	-	-	-	-	-	-	0	-	-
25-29	-	-	-	-	-	-	-	-	-	0	-	-
30-34	-	-	-	-	-	-	-	-	-	0	-	-
35-39	3	-	-	-	-	-	-	-	-	3	424,609	55,150
40-44	1	1	1	1	-	-	-	-	-	4	566,867	115,704
45-49	1	1	-	2	-	-	-	-	-	4	560,972	322,980
50-54	1	1	4	2	-	-	-	-	-	8	1,134,228	457,634
55-59	-	3	3	-	2	3	1	-	-	12	1,701,012	2,017,015
60-64	4	2	3	-	-	2	-	1	-	12	1,684,503	1,169,873
65-69	2	1	1	1	4	1	-	2	-	12	1,708,056	2,376,893
70-74	-	-	-	-	-	-	-	-	-	0	-	-
75 and Over	-	-	-	-	-	-	-	1	-	1	156,816	749,997
<b>Total</b>	<b>12</b>	<b>9</b>	<b>12</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>1</b>	<b>4</b>	<b>56</b>	<b>56</b>	<b>\$ 7,937,062</b>	<b>\$ 7,265,246</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Previous Valuation		Current Valuation		Change
Average Age:	58.7	Average Age:	57.4	(1.3)
Average Vesting Service:	15.5	Average Vesting Service:	10.4	(5.1)
Average Annual Pay <sup>1</sup> :	\$142,636	Average Annual Pay:	\$141,733	(\$903)
Average Account Balance:	\$125,768	Average Account Balance:	\$129,737	\$3,969
Vested Participants	41	Vested Participants	44	3
Nonvested Participants	10	Nonvested Participants	12	2
Total Participants	51	Total Participants	56	5

Current Age	Annualized Salary as of Valuation Date										Totals
	Less Than \$20,000	\$20,000-\$29,999	\$30,000-\$39,999	\$40,000-\$49,999	\$50,000-\$59,999	\$60,000-\$69,999	\$70,000-\$79,999	\$80,000-\$89,999	\$90,000-\$99,999	\$100,000 & Over	
Under 20	-	-	-	-	-	-	-	-	-	-	0
20-24	-	-	-	-	-	-	-	-	-	-	0
25-29	-	-	-	-	-	-	-	-	-	-	0
30-34	-	-	-	-	-	-	-	-	-	-	0
35-39	-	-	-	-	-	-	-	-	-	3	3
40-44	-	-	-	-	-	-	-	-	-	4	4
45-49	-	-	-	-	-	-	-	-	-	4	4
50-54	-	-	-	-	-	-	-	-	-	8	8
55-59	-	-	-	-	-	-	-	-	-	12	12
60-64	-	-	-	-	-	-	-	-	-	12	12
65-69	-	-	-	-	-	-	-	-	-	12	12
70-74	-	-	-	-	-	-	-	-	-	-	0
75 and Over	-	-	-	-	-	-	-	-	-	1	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>56</b>

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

# AGE/SERVICE/SALARY BY GROUP AS OF JULY 1, 2016

## Law Enforcement with Prior Main System Service

Total	Service as of Valuation Date									Totals	Valuation Payroll	Contribution Account Balance
	Current Age	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35 and Over			
Under 20	-	-	-	-	-	-	-	-	-	0	\$ -	\$ -
20-24	50	-	-	-	-	-	-	-	-	50	2,259,872	146,130
25-29	97	16	-	-	-	-	-	-	-	113	5,752,162	868,222
30-34	52	38	10	-	-	-	-	-	-	100	5,406,520	1,352,804
35-39	22	18	18	3	-	-	-	-	-	61	3,494,723	1,333,502
40-44	14	13	15	10	3	-	-	-	-	55	3,470,751	1,877,942
45-49	16	7	8	4	4	2	1	-	-	42	2,479,679	1,935,330
50-54	3	5	4	3	6	6	-	-	-	27	1,888,556	2,004,882
55-59	5	5	3	-	4	4	5	1	1	27	1,848,732	2,351,722
60-64	1	4	2	2	3	1	4	1	1	18	1,413,068	2,207,537
65-69	1	-	-	-	-	1	-	-	-	2	113,839	349,590
70-74	1	1	1	-	-	-	-	-	-	3	97,967	23,190
75 and Over	-	-	-	-	-	-	-	-	-	0	-	-
<b>Total</b>	<b>262</b>	<b>107</b>	<b>61</b>	<b>22</b>	<b>20</b>	<b>14</b>	<b>10</b>	<b>2</b>	<b>498</b>	<b>\$ 28,225,868</b>	<b>\$ 14,450,851</b>	

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

	Previous Valuation	Current Valuation	Change
Average Age:	37.1	37.3	0.2
Average Vesting Service:	6.3	6.6	0.3
Average Annual Pay <sup>1</sup> :	\$58,781	\$56,678	(\$2,103)
Average Account Balance:	\$21,274	\$29,018	\$7,744
Vested Participants	190	319	129
Nonvested Participants	128	179	51
Total Participants	318	498	180

Current Age	Annualized Salary as of Valuation Date										Totals
	Less Than \$20,000	\$20,000-\$29,999	\$30,000-\$39,999	\$40,000-\$49,999	\$50,000-\$59,999	\$60,000-\$69,999	\$70,000-\$79,999	\$80,000-\$89,999	\$90,000-\$99,999	\$100,000 & Over	
Under 20	-	-	-	-	-	-	-	-	-	-	0
20-24	-	3	17	14	14	2	-	-	-	-	50
25-29	-	1	25	33	24	27	3	-	-	-	113
30-34	1	1	6	30	36	22	3	1	-	-	100
35-39	-	2	4	11	16	19	6	2	1	-	61
40-44	-	-	2	12	9	14	11	5	1	1	55
45-49	-	1	2	10	6	16	5	1	-	1	42
50-54	-	-	-	3	5	5	6	4	4	-	27
55-59	-	1	-	1	5	8	8	2	1	1	27
60-64	-	-	-	2	2	4	3	1	3	3	18
65-69	1	-	-	-	-	-	-	-	1	-	2
70-74	1	1	-	-	1	-	-	-	-	-	3
75 and Over	-	-	-	-	-	-	-	-	-	-	0
<b>Total</b>	<b>3</b>	<b>10</b>	<b>56</b>	<b>116</b>	<b>118</b>	<b>117</b>	<b>45</b>	<b>16</b>	<b>11</b>	<b>6</b>	<b>498</b>

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

# AGE/SERVICE/SALARY BY GROUP AS OF JULY 1, 2016

## Law Enforcement without Prior Main System Service

Total	Service as of Valuation Date									Totals	Valuation Payroll	Contribution Account Balance
	Current Age	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35 and Over			
Under 20	1	-	-	-	-	-	-	-	-	1	\$ 44,911	\$ -
20-24	9	-	-	-	-	-	-	-	-	9	343,158	15,840
25-29	15	3	-	-	-	-	-	-	-	18	746,354	83,286
30-34	12	7	-	-	-	-	-	-	-	19	832,220	174,091
35-39	13	3	-	-	-	-	-	-	-	16	707,408	142,854
40-44	6	6	-	1	-	-	-	-	-	13	585,293	377,790
45-49	5	5	-	1	-	-	-	-	-	11	550,984	154,604
50-54	2	3	1	-	1	-	-	-	-	7	423,490	203,064
55-59	2	-	2	-	-	-	-	-	-	4	273,030	247,766
60-64	1	-	-	1	-	-	-	-	-	2	114,888	238,427
65-69	-	-	-	-	-	-	-	-	-	0	-	-
70-74	-	-	-	-	-	-	-	-	-	0	-	-
75 and Over	-	-	-	-	-	-	-	-	-	0	-	-
<b>Total</b>	<b>66</b>	<b>27</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>\$ 4,621,734</b>	<b>\$ 1,637,722</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Previous Valuation		Current Valuation		Change
Average Age:	37.8	Average Age:	37.6	(0.3)
Average Vesting Service:	3.8	Average Vesting Service:	3.7	(0.1)
Average Annual Pay <sup>1</sup> :	\$48,204	Average Annual Pay:	\$46,217	(\$1,987)
Average Account Balance:	\$13,433	Average Account Balance:	\$16,377	\$2,944
Vested Participants	46	Vested Participants	54	8
Nonvested Participants	49	Nonvested Participants	46	(3)
Total Participants	95	Total Participants	100	5

Current Age	Annualized Salary as of Valuation Date										Totals
	Less Than \$20,000	\$20,000-\$29,999	\$30,000-\$39,999	\$40,000-\$49,999	\$50,000-\$59,999	\$60,000-\$69,999	\$70,000-\$79,999	\$80,000-\$89,999	\$90,000-\$99,999	\$100,000 & Over	
Under 20	1	-	-	-	-	-	-	-	-	-	1
20-24	1	1	3	4	-	-	-	-	-	-	9
25-29	1	-	5	12	-	-	-	-	-	-	18
30-34	-	1	3	14	1	-	-	-	-	-	19
35-39	-	1	2	10	3	-	-	-	-	-	16
40-44	1	-	1	7	4	-	-	-	-	-	13
45-49	-	-	1	4	5	1	-	-	-	-	11
50-54	-	-	1	-	2	3	1	-	-	-	7
55-59	-	-	-	-	1	1	1	1	-	-	4
60-64	-	-	-	-	2	-	-	-	-	-	2
65-69	-	-	-	-	-	-	-	-	-	-	0
70-74	-	-	-	-	-	-	-	-	-	-	0
75 and Over	-	-	-	-	-	-	-	-	-	-	0
<b>Total</b>	<b>4</b>	<b>3</b>	<b>16</b>	<b>51</b>	<b>18</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>-</b>	<b>100</b>

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

# AGE/SERVICE/SALARY BY GROUP AS OF JULY 1, 2016

## Combined Main System, Judges and Law Enforcement

Total	Service as of Valuation Date									Totals	Valuation Payroll	Contribution Account Balance
	Current Age	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35 and Over			
Under 20	30	-	-	-	-	-	-	-	-	30	\$ 922,303	\$ 29,525
20-24	874	4	-	-	-	-	-	-	-	878	29,043,531	2,504,563
25-29	1,787	227	3	-	-	-	-	-	-	2,017	79,564,070	14,689,273
30-34	1,581	699	138	-	-	-	-	-	-	2,418	106,284,919	32,861,165
35-39	1,384	655	416	128	-	-	-	-	-	2,583	116,527,250	51,405,707
40-44	1,083	630	371	368	82	2	-	-	-	2,536	115,458,115	72,804,916
45-49	1,021	625	362	338	258	136	6	1	1	2,747	126,756,690	102,449,038
50-54	959	617	478	406	306	296	170	20	20	3,252	153,742,420	162,098,135
55-59	835	669	474	473	316	315	245	205	205	3,532	164,954,105	217,368,892
60-64	471	450	349	361	271	226	169	240	240	2,537	118,569,578	174,454,009
65-69	126	142	91	120	57	49	31	52	52	668	29,664,225	38,061,833
70-74	34	42	28	15	8	7	4	19	19	157	5,439,503	8,200,840
<b>75 and Over</b>	<b>11</b>	<b>13</b>	<b>12</b>	<b>12</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>5</b>	<b>61</b>	<b>1,628,640</b>	<b>2,390,462</b>
<b>Total</b>	<b>10,196</b>	<b>4,773</b>	<b>2,722</b>	<b>2,221</b>	<b>1,300</b>	<b>1,034</b>	<b>628</b>	<b>542</b>	<b>23,416</b>		<b>\$1,048,555,347</b>	<b>\$ 879,318,358</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

	Previous Valuation	Current Valuation	Change
Average Age:	46.4	46.3	(0.1)
Average Vesting Service:	9.6	9.6	(0.0)
Average Annual Pay <sup>1</sup> :	\$44,831	\$44,779	(\$52)
Average Account Balance:	\$34,507	\$37,552	\$3,045
Vested Participants	15,645	16,018	373
Nonvested Participants	7,200	7,398	198
Total Participants	22,845	23,416	571

Current Age	Annualized Salary as of Valuation Date										Totals
	Less Than \$20,000	\$20,000-\$29,999	\$30,000-\$39,999	\$40,000-\$49,999	\$50,000-\$59,999	\$60,000-\$69,999	\$70,000-\$79,999	\$80,000-\$89,999	\$90,000-\$99,999	\$100,000 & Over	
Under 20	3	14	9	2	2	-	-	-	-	-	30
20-24	66	310	265	168	61	7	1	-	-	-	878
25-29	128	424	508	495	308	127	18	5	2	2	2,017
30-34	148	360	524	595	437	194	90	45	10	15	2,418
35-39	214	421	467	514	466	257	108	63	42	31	2,583
40-44	219	402	477	512	378	241	140	80	41	46	2,536
45-49	249	451	477	545	435	246	146	80	41	77	2,747
50-54	244	501	638	684	451	305	162	95	70	102	3,252
55-59	249	621	732	653	480	346	187	94	50	120	3,532
60-64	226	415	512	460	367	227	112	72	52	94	2,537
65-69	104	115	133	108	88	46	17	13	13	31	668
70-74	47	33	22	24	12	8	5	3	-	3	157
<b>75 and Over</b>	<b>28</b>	<b>16</b>	<b>9</b>	<b>4</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>61</b>
<b>Total</b>	<b>1,925</b>	<b>4,083</b>	<b>4,773</b>	<b>4,764</b>	<b>3,488</b>	<b>2,004</b>	<b>986</b>	<b>550</b>	<b>321</b>	<b>522</b>	<b>23,416</b>

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

## HISTORICAL SCHEDULE OF ACTIVE MEMBER DATA THROUGH JULY 1, 2016

Main System				
Valuation Date 7/1	Number	Annual Payroll (\$ in Millions)	Average Annual Pay <sup>1</sup>	% Increase in Avg Pay
2007	18,299	\$570.4	\$31,169	3.9%
2008	19,042	627.6	32,959	5.7%
2009	19,686	684.3	34,762	5.5%
2010	20,372	751.1	36,868	6.1%
2011	20,359	785.4	38,577	4.6%
2012	20,738	781.6	37,690	(2.3)%
2013	21,201	865.9	40,841	8.4%
2014	21,814	946.2	43,376	9.3%
2015	22,381	993.6	43,395	0.0%
2016	22,762	1,007.8	44,274	2.0%

Judges				
Valuation Date 7/1	Number	Annual Payroll (\$ in Millions)	Average Annual Pay <sup>1</sup>	% Increase in Avg Pay
2007	47	\$4.9	\$103,683	4.2%
2008	47	5.2	111,427	7.5%
2009	47	5.4	115,741	3.9%
2010	47	5.7	120,962	4.5%
2011	49	6.2	126,474	4.6%
2012	49	6.1	124,645	(1.4)%
2013	49	6.6	134,673	8.0%
2014	50	7.0	139,290	3.4%
2015	51	7.3	142,636	2.4%
2016	56	7.9	141,733	(0.6)%

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

Values prior to July 1, 2016, were calculated by the prior actuary.

## HISTORICAL SCHEDULE OF ACTIVE MEMBER DATA THROUGH JULY 1, 2016

Law Enforcement with Prior Main System Service				
Valuation Date 7/1	Number	Annual Payroll (\$ in Millions)	Average Annual Pay <sup>1</sup>	% Increase in Avg Pay
2007	178	\$6.4	\$35,672	2.8%
2008	177	7.1	39,674	11.2%
2009	180	7.0	38,965	(1.8)%
2010	217	11.9	54,467	39.8%
2011	226	10.1	44,908	(17.6)%
2012	239	10.8	45,074	0.4%
2013	268	13.4	49,981	10.9%
2014	315	16.7	53,121	6.3%
2015	318	18.7	58,781	10.7%
2016	498	28.2	56,678	(3.6)%

Law Enforcement without Prior Main System Service				
Valuation Date 7/1	Number	Annual Payroll (\$ in Millions)	Average Annual Pay <sup>1</sup>	% Increase in Avg Pay
2007	28	\$0.7	\$25,327	(13.5)%
2008	30	0.8	27,472	8.5%
2009	30	0.9	31,660	15.2%
2010	32	1.1	35,572	12.4%
2011	61	2.4	39,911	12.2%
2012	65	2.4	36,588	(8.3)%
2013	70	2.6	36,998	1.1%
2014	83	3.6	43,872	18.6%
2015	95	4.6	48,204	9.9%
2016	100	4.6	46,217	(4.1)%

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

Values prior to July 1, 2016, were calculated by the prior actuary.

## SUMMARY OF ACTIVE MEMBER DATA AS OF JULY 1, 2016

### Summary of Active Member Eligibility for Benefits

Active Members Eligible For:	Main System	Judges	Law	Law	Total
			Enforcement with Prior Main Service	Enforcement without Prior Main Service	
Retirement					
Normal	868	13	45	3	929
Rule of 85	1,351	7	17	0	1,375
Early Retirement	<u>5,159</u>	<u>20</u>	<u>27</u>	<u>5</u>	<u>5,211</u>
Total Retirement	7,378	40	89	8	7,515
Deferred Retirement	<u>8,223</u>	<u>4</u>	<u>230</u>	<u>46</u>	<u>8,503</u>
Total Vested	15,601	44	319	54	16,018
Non- Vested	7,161	12	179	46	7,398
<b>Grand Total</b>	<b>22,762</b>	<b>56</b>	<b>498</b>	<b>100</b>	<b>23,416</b>

### Transfers

	Current System					Total
	Main System	Judges	Law Enforcement with Prior Main Service	Law Enforcement without Prior Main Service	Highway Patrol	
<b>Original System</b>						
Main System		27	160	25	30	242
Judges	1					1
Law Enforcement with Prior Main Service	37			4	1	42
Law Enforcement without Prior Main Service	18		3			21
Highway Patrol	10		2	1		13
<b>Total</b>	<b>66</b>	<b>27</b>	<b>165</b>	<b>30</b>	<b>31</b>	<b>319</b>

## SCHEDULE OF MEMBERS IN PAY STATUS AS OF JULY 1, 2016

Main System							
Monthly Amount	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under \$200	541	539	12	28	176	1,296	1,120
\$200 - \$400	578	805	97	34	225	1,739	1,514
\$400 - \$600	471	565	104	48	174	1,362	1,188
\$600 - \$800	328	277	66	115	108	894	786
\$800 - \$1,000	276	125	36	252	49	738	689
\$1,000 - \$1,200	203	108	6	338	40	695	655
\$1,200 - \$1,400	165	46	6	356	36	609	573
\$1,400 - \$1,600	132	21	2	308	21	484	463
\$1,600 - \$1,800	105	15	0	285	17	422	405
\$1,800 - \$2,000	91	9	1	256	16	373	357
\$2,000 - \$2,200	75	4	0	213	6	298	292
\$2,200 - \$2,400	65	8	0	208	9	290	281
\$2,400 - \$2,600	56	1	0	169	2	228	226
\$2,600 - \$2,800	42	1	0	142	5	190	185
\$2,800 - \$3,000	33	2	0	97	4	136	132
\$3,000 and Over	176	1	0	445	18	640	622
<b>Total</b>	<b>3,337</b>	<b>2,527</b>	<b>330</b>	<b>3,294</b>	<b>906</b>	<b>10,394</b>	<b>9,488</b>
Payment Option	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Life	2,160	1,814	271	1,603	194	6,042	5,848
Life 1% Graduated Benefits	4	0	0	1	0	5	5
Life 2% Graduated Benefits	6	0	0	3	0	9	9
Level Social Security Payment	0	19	0	110	0	129	129
Joint & 100% Survivor	750	431	31	902	478	2,592	2,114
Joint & 100% Survivor 1% Graduated Benefits	0	0	0	2	0	2	2
Joint & 100% Survivor 2% Graduated Benefits	5	0	0	3	0	8	8
Joint & 50% Survivor	345	171	23	605	204	1,348	1,144
Joint & 50% Survivor 1% Graduated Benefits	3	0	0	0	0	3	3
Joint & 50% Survivor 2% Graduated Benefits	1	0	0	0	0	1	1
20 Year C & L	22	16	0	10	18	66	48
10 Year C & L	38	66	2	44	6	156	150
10 Year C & L 1% Graduated Benefits	0	0	0	1	0	1	1
5 Year C & L	3	10	3	10	6	32	26
<b>Total</b>	<b>3,337</b>	<b>2,527</b>	<b>330</b>	<b>3,294</b>	<b>906</b>	<b>10,394</b>	<b>9,488</b>
Age	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under 50	0	0	16	0	27	43	16
50 - 54	16	0	27	23	18	84	66
55 - 59	47	48	43	221	43	402	359
60 - 64	116	410	68	719	83	1,396	1,313
65 - 69	946	682	66	1,031	119	2,844	2,725
70 - 74	837	452	43	587	150	2,069	1,919
75 and Over	1,375	935	67	713	466	3,556	3,090
<b>Total</b>	<b>3,337</b>	<b>2,527</b>	<b>330</b>	<b>3,294</b>	<b>906</b>	<b>10,394</b>	<b>9,488</b>

	Previous Valuation	Current Valuation	Change
Average Age	72.1	71.9	-0.2
Average Monthly Benefit	\$1,085	\$1,120	\$35
Total Members in Pay Status	9,979	10,394	415

\*Includes Rule of 85, Rule of 88 and Rule of 90.

\*\*Total excluding beneficiaries.

## SCHEDULE OF MEMBERS IN PAY STATUS AS OF JULY 1, 2016

Judges							
Monthly Amount	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under \$400	0	0	0	0	0	0	0
\$400 - \$800	0	0	0	0	1	1	0
\$800 - \$1,200	1	0	0	0	0	1	1
\$1,200 - \$1,600	0	0	0	1	1	2	1
\$1,600 - \$2,000	1	2	0	0	1	4	3
\$2,000 - \$2,400	0	0	0	0	0	0	0
\$2,400 - \$2,800	1	0	0	0	1	2	1
\$2,800 - \$3,200	2	0	0	0	2	4	2
\$3,200 - \$3,600	1	1	0	1	1	4	3
\$3,600 - \$4,000	3	1	0	0	0	4	4
\$4,000 - \$4,400	0	1	0	0	0	1	1
\$4,400 - \$4,800	3	0	0	2	1	6	5
\$4,800 - \$5,200	1	0	0	1	2	4	2
\$5,200 - \$5,600	0	0	0	1	0	1	1
\$5,600 - \$6,000	1	0	0	1	0	2	2
\$6,000 and Over	4	0	0	3	0	7	7
<b>Total</b>	<b>18</b>	<b>5</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>43</b>	<b>33</b>
Payment Option	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Life	0	0	0	0	3	3	0
Level Social Security Payment	0	0	0	0	0	0	0
Joint & 100% Survivor	12	3	0	5	6	26	20
Joint & 50% Survivor	6	2	0	5	1	14	13
10 Year C & L	0	0	0	0	0	0	0
5 Year C & L	0	0	0	0	0	0	0
<b>Total</b>	<b>18</b>	<b>5</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>43</b>	<b>33</b>
Age	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under 50	0	0	0	0	0	0	0
50 - 54	0	0	0	0	0	0	0
55 - 59	0	0	0	0	0	0	0
60 - 64	0	1	0	1	1	3	2
65 - 69	4	2	0	3	5	14	9
70 - 74	5	0	0	2	1	8	7
75 and Over	9	2	0	4	3	18	15
<b>Total</b>	<b>18</b>	<b>5</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>43</b>	<b>33</b>

	Previous Valuation	Current Valuation	Change
Average Age	74.1	73.7	-0.4
Average Monthly Benefit	\$4,136	\$4,112	(\$24)
Total Members in Pay Status	44	43	-1

\*Includes Rule of 85, Rule of 88 and Rule of 90.

\*\*Total excluding beneficiaries.

## SCHEDULE OF MEMBERS IN PAY STATUS AS OF JULY 1, 2016

### Law Enforcement with prior Main System Service

Monthly Amount	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under \$200	3	1	0	0	3	7	4
\$200 - \$400	1	1	0	0	2	4	2
\$400 - \$600	5	2	0	0	1	8	7
\$600 - \$800	2	1	0	0	2	5	3
\$800 - \$1,000	4	1	0	1	0	6	6
\$1,000 - \$1,200	8	0	1	0	0	9	9
\$1,200 - \$1,400	2	0	0	0	0	2	2
\$1,400 - \$1,600	5	2	0	2	0	9	9
\$1,600 - \$1,800	1	0	0	1	0	2	2
\$1,800 - \$2,000	1	1	0	1	0	3	3
\$2,000 - \$2,200	5	0	0	1	0	6	6
\$2,200 - \$2,400	3	0	0	1	0	4	4
\$2,400 - \$2,600	1	1	0	0	0	2	2
\$2,600 - \$2,800	2	0	0	0	0	2	2
\$2,800 - \$3,000	1	0	0	0	0	1	1
\$3,000 and Over	4	1	0	4	0	9	9
<b>Total</b>	<b>48</b>	<b>11</b>	<b>1</b>	<b>11</b>	<b>8</b>	<b>79</b>	<b>71</b>
Payment Option	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Life	24	5	1	1	0	31	31
Level Social Security Payment	1	4	0	1	0	6	6
Joint & 100% Survivor	16	2	0	8	2	28	26
Joint & 50% Survivor	7	0	0	1	0	8	8
10 Year C & L	0	0	0	0	0	0	0
5 Year C & L	0	0	0	0	0	0	0
20 Year Certain	0	0	0	0	6	6	6
<b>Total</b>	<b>48</b>	<b>11</b>	<b>1</b>	<b>11</b>	<b>8</b>	<b>79</b>	<b>71</b>
Age	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under 50	0	0	0	0	5	5	0
50 - 54	0	1	0	0	0	1	1
55 - 59	6	4	1	6	0	17	17
60 - 64	16	2	0	2	2	22	20
65 - 69	18	1	0	3	1	23	22
70 - 74	7	3	0	0	0	10	10
75 and Over	1	0	0	0	0	1	1
<b>Total</b>	<b>48</b>	<b>11</b>	<b>1</b>	<b>11</b>	<b>8</b>	<b>79</b>	<b>71</b>

	Previous Valuation	Current Valuation	Change
Average Age	62.0	62.4	0.4
Average Monthly Benefit	\$1,601	\$1,525	(\$76)
Total Members in Pay Status	73	79	6

\*Includes Rule of 85, Rule of 88 and Rule of 90.

\*\*Total excluding beneficiaries.

## SCHEDULE OF MEMBERS IN PAY STATUS AS OF JULY 1, 2016

### Law Enforcement without prior Main System Service

Monthly Amount	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under \$200	0	0	0	0	0	0	0
\$200 - \$400	1	0	0	0	0	1	1
\$400 - \$600	0	0	0	0	0	0	0
\$600 - \$800	0	0	0	0	0	0	0
\$800 - \$1,000	0	0	1	0	0	1	1
\$1,000 - \$1,200	0	0	0	0	0	0	0
\$1,200 - \$1,400	0	0	0	0	0	0	0
\$1,400 - \$1,600	0	0	0	0	0	0	0
\$1,600 - \$1,800	0	0	0	0	0	0	0
\$1,800 - \$2,000	0	0	0	0	0	0	0
\$2,000 - \$2,200	0	0	0	0	0	0	0
\$2,200 - \$2,400	0	0	0	0	0	0	0
\$2,400 - \$2,600	0	0	0	0	0	0	0
\$2,600 - \$2,800	0	0	0	0	0	0	0
\$2,800 - \$3,000	0	0	0	0	0	0	0
\$3,000 and Over	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
Payment Option	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Life	0	0	1	0	0	1	1
Level Social Security Payment	0	0	0	0	0	0	0
Joint & 100% Survivor	1	0	0	0	0	1	1
Joint & 50% Survivor	0	0	0	0	0	0	0
10 Year C & L	0	0	0	0	0	0	0
5 Year C & L	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
Age	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under 50	0	0	1	0	0	1	1
50 - 54	0	0	0	0	0	0	0
55 - 59	0	0	0	0	0	0	0
60 - 64	1	0	0	0	0	1	1
65 - 69	0	0	0	0	0	0	0
70 - 74	0	0	0	0	0	0	0
75 and Over	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>

	Previous Valuation	Current Valuation	Change
Average Age	36.0	48.4	12.4
Average Monthly Benefit	\$816	\$544	(\$272)
Total Members in Pay Status	1	2	1

\*Includes Rule of 85, Rule of 88 and Rule of 90.

\*\*Total excluding beneficiaries.

## SCHEDULE OF NEW PENSIONS AWARDED DURING THE YEAR AS OF JULY 1, 2016

Main System, Judges, Law Enforcement							
Monthly Amount	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under \$200	41	14	0	0	13	68	55
\$200 - \$400	45	33	3	0	9	90	81
\$400 - \$600	51	29	2	0	4	86	82
\$600 - \$800	35	13	1	0	10	59	49
\$800 - \$1,000	31	12	6	0	3	52	49
\$1,000 - \$1,200	29	14	1	0	5	49	44
\$1,200 - \$1,400	22	7	0	2	4	35	31
\$1,400 - \$1,600	25	4	1	2	2	34	32
\$1,600 - \$1,800	29	5	0	2	3	39	36
\$1,800 - \$2,000	23	1	0	0	1	25	24
\$2,000 - \$2,200	28	0	0	1	1	30	29
\$2,200 - \$2,400	27	1	0	0	2	30	28
\$2,400 - \$2,600	23	1	0	0	0	24	24
\$2,600 - \$2,800	17	0	0	1	0	18	18
\$2,800 - \$3,000	16	1	0	1	0	18	18
\$3,000 and Over	88	0	0	11	4	103	99
<b>Total</b>	<b>530</b>	<b>135</b>	<b>14</b>	<b>20</b>	<b>61</b>	<b>760</b>	<b>699</b>
Payment Option	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Life	270	93	7	10	9	389	380
Life 1% Graduated Benefits	1	0	0	0	0	1	1
Life 2% Graduated Benefits	4	0	0	0	0	4	4
Level Social Security Payment	0	0	0	0	0	0	0
Joint & 100% Survivor	161	25	6	9	32	233	201
Joint & 100% Survivor 1% Graduated Benefits	0	0	0	0	0	0	0
Joint & 100% Survivor 2% Graduated Benefits	2	0	0	0	0	2	2
Joint & 50% Survivor	80	15	1	1	17	114	97
Joint & 50% Survivor 1% Graduated Benefits	1	0	0	0	0	1	1
Joint & 50% Survivor 2% Graduated Benefits	1	0	0	0	0	1	1
20 Year C & L	0	0	0	0	0	0	0
10 Year C & L	0	0	0	0	0	0	0
10 Year C & L 1% Graduated Benefits	0	0	0	0	0	0	0
5 Year C & L	0	0	0	0	0	0	0
5 Year Certain	0	0	0	0	0	0	0
10 Year Certain	2	1	0	0	0	3	3
10 Year Certain 1% Graduated Benefits	0	0	0	0	0	0	0
20 Year Certain	8	1	0	0	3	12	9
<b>Total</b>	<b>530</b>	<b>135</b>	<b>14</b>	<b>20</b>	<b>61</b>	<b>760</b>	<b>699</b>
Age	Normal	Early	Disability	Service*	Beneficiary	Total	Total**
Under 50	0	0	2	0	5	7	2
50 - 54	15	0	3	0	0	18	18
55 - 59	49	15	4	4	6	78	72
60 - 64	113	108	5	10	10	246	236
65 - 69	296	12	0	6	9	323	314
70 - 74	40	0	0	0	11	51	40
75 and Over	17	0	0	0	20	37	17
<b>Total</b>	<b>530</b>	<b>135</b>	<b>14</b>	<b>20</b>	<b>61</b>	<b>760</b>	<b>699</b>

	Previous Valuation	Current Valuation
New Pensions Awarded	N/A	760
Average Age	N/A	63.2
Average Monthly Benefit	N/A	\$1,760

\*Includes Rule of 85, Rule of 88 and Rule of 90.

**SCHEDULE OF AVERAGE BENEFIT PAYMENTS  
AS OF JULY 1, 2016**

Main System		Years of Vesting Service						Total
		<10	10-15	15-19	20-24	25-29	>=30	
2012	Number of Retirees	1,405	1,223	1,134	1,092	1,136	1,477	7,467
	Average Monthly Benefit	\$238	\$411	\$602	\$993	\$1,462	\$3,167	\$1,000
	Average Years of Service	6.27	12.32	17.36	22.50	27.24	35.07	20.21
2013	Number of Retirees	1,611	1,258	1,146	1,136	1,174	1,519	7,844
	Average Monthly Benefit	\$242	\$423	\$626	\$1,031	\$1,503	\$2,270	\$1,023
	Average Years of Service	6.10	12.32	17.35	22.50	27.26	35.01	19.88
2014	Number of Retirees	1,760	1,330	1,193	1,191	1,252	1,662	8,388
	Average Monthly Benefit	\$248	\$440	\$647	\$1,068	\$1,547	\$2,345	\$1,061
	Average Years of Service	6.07	12.32	17.33	22.53	27.25	35.07	19.91
2015	Number of Retirees	1,957	1,418	1,231	1,273	1,352	1,863	9,094
	Average Monthly Benefit	\$290	\$462	\$674	\$1,123	\$1,616	\$2,462	\$1,128
	Average Years of Service	5.90	12.32	17.30	22.55	27.27	35.08	19.93
2016	Number of Retirees	1,848	1,471	1,268	1,336	1,470	2,095	9,488
	Average Monthly Benefit	\$255	\$469	\$684	\$1,151	\$1,613	\$2,432	\$1,163
	Average Years of Service	6.25	12.33	17.29	22.57	27.27	35.17	20.61
<b>Judges</b>		<b>&lt;10</b>	<b>10-15</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>&gt;=30</b>	<b>Total</b>
2012	Number of Retirees	0	2	7	5	8	3	25
	Average Monthly Benefit	\$0	\$2,281	\$3,733	\$4,521	\$4,231	\$3,794	\$3,941
	Average Years of Service	0.00	12.38	17.62	23.75	26.94	33.69	23.34
2013	Number of Retirees	1	5	8	4	7	2	27
	Average Monthly Benefit	\$1,057	\$2,445	\$4,124	\$4,740	\$4,404	\$3,740	\$3,835
	Average Years of Service	3.33	11.92	17.54	24.04	26.56	30.79	20.26
2014	Number of Retirees	1	5	8	5	7	3	29
	Average Monthly Benefit	\$1,057	\$2,445	\$4,124	\$5,303	\$4,404	\$5,258	\$4,117
	Average Years of Service	3.33	11.92	17.54	23.78	26.56	31.86	20.82
2015	Number of Retirees	1	6	8	5	9	4	33
	Average Monthly Benefit	\$1,057	\$2,817	\$4,288	\$5,303	\$5,097	\$5,887	\$4,491
	Average Years of Service	3.33	12.25	17.73	23.78	26.82	32.27	21.46
2016	Number of Retirees	2	3	6	6	8	8	33
	Average Monthly Benefit	\$2,217	\$2,773	\$3,621	\$5,026	\$4,598	\$5,701	\$4,455
	Average Years of Service	6.38	11.58	17.35	23.58	26.92	35.16	23.93

*Includes retired and disabled members.*

*Values prior to July 1, 2016, were calculated by the prior actuary.*

**SCHEDULE OF AVERAGE BENEFIT PAYMENTS  
AS OF JULY 1, 2016**

<b>Law Enforcement with Main Service</b>		<b>Years of Vesting Service</b>					<b>Total</b>	
		<b>&lt;10</b>	<b>10-15</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>		<b>&gt;=30</b>
2012	Number of Retirees	5	3	3	9	10	7	37
	Average Monthly Benefit	\$426	\$1,049	\$1,161	\$1,307	\$1,956	\$3,010	\$1,653
	Average Years of Service	6.73	12.42	18.94	21.57	26.97	32.86	22.21
2013	Number of Retirees	6	5	3	9	12	10	45
	Average Monthly Benefit	\$500	\$939	\$1,161	\$1,307	\$1,997	\$3,129	\$1,738
	Average Years of Service	7.10	12.70	18.94	21.57	27.10	33.00	22.49
2014	Number of Retirees	6	5	3	10	12	10	46
	Average Monthly Benefit	\$500	\$939	\$1,161	\$1,437	\$1,960	\$3,129	\$1,747
	Average Years of Service	7.10	12.70	18.64	21.64	27.18	33.00	22.55
2015	Number of Retirees	10	9	5	13	15	13	65
	Average Monthly Benefit	\$981	\$865	\$1,158	\$1,554	\$1,958	\$3,141	\$1,751
	Average Years of Service	5.10	12.45	18.56	21.94	27.12	32.78	21.14
2016	Number of Retirees	10	10	6	16	15	14	71
	Average Monthly Benefit	\$455	\$795	\$1,239	\$1,635	\$1,958	\$2,992	\$1,653
	Average Years of Service	5.84	12.63	18.43	22.08	27.12	32.89	21.35
<b>Law Enforcement without Main Service</b>		<b>&lt;10</b>	<b>10-15</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>&gt;=30</b>	<b>Total</b>
2012	Number of Retirees	0	0	0	0	0	0	0
	Average Monthly Benefit	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Average Years of Service	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2013	Number of Retirees	1	0	0	0	0	0	1
	Average Monthly Benefit	\$816	\$0	\$0	\$0	\$0	\$0	\$816
	Average Years of Service	0.58	0.00	0.00	0.00	0.00	0.00	0.58
2014	Number of Retirees	1	0	0	0	0	0	1
	Average Monthly Benefit	\$816	\$0	\$0	\$0	\$0	\$0	\$816
	Average Years of Service	0.58	0.00	0.00	0.00	0.00	0.00	0.58
2015	Number of Retirees	1	0	0	0	0	0	1
	Average Monthly Benefit	\$816	\$0	\$0	\$0	\$0	\$0	\$816
	Average Years of Service	0.58	0.00	0.00	0.00	0.00	0.00	0.58
2016	Number of Retirees	2	0	0	0	0	0	2
	Average Monthly Benefit	\$544	\$0	\$0	\$0	\$0	\$0	\$544
	Average Years of Service	2.29	0.00	0.00	0.00	0.00	0.00	2.29

*Includes retired and disabled members.*

*Values prior to July 1, 2016, were calculated by the prior actuary.*

## SCHEDULE OF RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM THE ROLLS

### Main System and Special Prior Service Pensioners

Plan Year	Beg of Year		Added to Rolls		Removed from Rolls		End of Year Balance		Average	% Increase
	No.	Ann. Benefits*	No.	Ann. Benefits*	No.	Ann. Benefits*	No.**	Ann. Benefits*	Annual Benefit	in Annual Benefit
<b>Retirement</b>										
2007	6,198	\$ 56.7	528	\$ 6.4	(220)	\$ (1.4)	6,506	\$ 61.7	\$ 9,481	8.8%
2008	6,506	61.7	547	7.2	(240)	(1.7)	6,813	67.2	9,869	8.9%
2009	6,813	67.2	567	7.1	(222)	(1.9)	7,158	72.4	10,120	7.7%
2010	7,158	72.4	468	6.5	(254)	(1.9)	7,372	77.0	10,451	6.4%
2011	7,372	77.0	618	9.4	(230)	(1.8)	7,760	84.6	10,904	9.9%
2012	7,760	84.6	698	12.5	(216)	(1.8)	8,242	95.3	11,566	12.6%
2013	8,242	95.3	708	10.9	(284)	(4.0)	8,666	102.2	11,798	7.2%
2014	8,666	102.2	855	13.2	(291)	(2.4)	9,230	113.0	12,243	10.6%
2015	9,230	113.0	992	19.3	(243)	(2.4)	9,979	129.9	13,017	15.0%
2016	9,979	129.9	703	12.3	(288)	(2.6)	10,394	139.6	13,435	7.5%

\*\$ in millions

\*\*Excludes 24 pensioners as of June 30, 2014, 28 pensioners as of June 30, 2015, and 35 pensioners as of June 30, 2016 in suspended status.

### Judges

Plan Year	Beg of Year		Added to Rolls		Removed from Rolls		End of Year Balance		Average	% Increase
	No.	Ann. Benefits	No.	Ann. Benefits	No.	Ann. Benefits	No.	Ann. Benefits	Annual Benefit	in Annual Benefit
<b>Retirement</b>										
2007	27	\$ 977,162	3	\$ 92,172	0	\$ 0	30	\$ 1,077,497	\$ 35,917	10.3%
2008	30	1,077,497	1	49,517	(1)	(33,795)	30	1,093,219	36,441	1.5%
2009	30	1,093,219	1	69,931	(3)	(92,038)	28	1,071,112	38,254	-2.0%
2010	28	1,071,112	4	194,159	(2)	(47,106)	30	1,218,165	40,605	13.7%
2011	30	1,218,165	5	273,928	(1)	(20,861)	34	1,471,232	43,272	20.8%
2012	34	1,471,232	0	0	0	(648)	34	1,470,584	43,252	0.0%
2013	34	1,470,584	2	60,181	0	0	36	1,530,765	42,521	4.1%
2014	36	1,530,765	2	190,156	0	0	38	1,720,921	45,287	12.4%
2015	38	1,720,921	6	462,888	0	0	44	2,183,809	49,632	26.9%
2016	44	2,183,809	2	85,597	(3)	(147,638)	43	2,121,768	49,343	-2.8%

### Law Enforcement with prior Main System Service

Plan Year	Beg of Year		Added to Rolls		Removed from Rolls		End of Year Balance		Average	% Increase
	No.	Ann. Benefits	No.	Ann. Benefits	No.	Ann. Benefits	No.	Ann. Benefits	Annual Benefit	in Annual Benefit
<b>Retirement</b>										
2007	10	\$ 138,595	5	\$ 74,509	0	\$ 0	15	\$ 213,045	\$ 14,207	53.7%
2008	15	213,045	6	122,584	0	0	21	335,688	15,985	57.6%
2009	21	335,688	4	78,938	(1)	(23,246)	24	391,380	16,307	16.6%
2010	24	391,380	10	176,285	(2)	(26,749)	32	540,916	16,904	38.2%
2011	32	540,916	9	217,899	0	0	41	758,815	18,508	40.3%
2012	41	758,815	6	105,606	0	0	47	864,421	18,392	13.9%
2013	47	864,421	9	225,057	0	(13,776)	56	1,075,702	19,209	24.4%
2014	56	1,075,702	7	83,168	(1)	(57,253)	62	1,101,617	17,768	2.4%
2015	62	1,101,617	11	301,041	0	0	73	1,402,658	19,215	27.3%
2016	73	1,402,658	7	53,522	(1)	(10,529)	79	1,445,651	18,299	3.1%

Values prior to July 1, 2016, were calculated by the prior actuary.

## SCHEDULE OF RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM THE ROLLS

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### Law Enforcement without prior Main System Service

Plan Year	Beg of Year		Added to Rolls		Removed from Rolls		End of Year Balance		Average Annual	% Increase
	No.	Ann. Benefits	No.	Ann. Benefits	No.	Ann. Benefits	No.	Ann. Benefits	Benefit	in Annual Benefit
<b>Retirement</b>										
2007	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	\$ 0	NA
2008	0	0	0	0	0	0	0	0	0	NA
2009	0	0	0	0	0	0	0	0	0	NA
2010	0	0	0	0	0	0	0	0	0	NA
2011	0	0	0	0	0	0	0	0	0	NA
2012	0	0	0	0	0	0	0	0	0	NA
2013	0	0	1	9,792	0	0	1	9,792	9,792	100.0%
2014	1	9,792	0	0	0	0	1	9,792	9,792	0.0%
2015	1	9,792	0	0	0	0	1	9,792	9,792	0.0%
2016	1	9,792	1	3,264	0	0	2	13,056	6,528	33.3%

Values prior to July 1, 2016, were calculated by the prior actuary.

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**SECTION D**

**GASB STATEMENT 67 SCHEDULES**

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# GASB STATEMENT NO. 67

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## Discussion

### Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain non-actuarial information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

### Financial Statements

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *statement of changes in fiduciary net position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

### Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- A description of benefits provided by the plan;
- The type of employees and number of members covered by the pension plan;
- A description of the plan's funding policy, which includes member and employer contribution requirements;
- The pension plan's investment policies;
- The pension plan's fiduciary net position, net pension liability and the pension plan's fiduciary net position as a percentage of the total pension liability;
- The net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- Significant assumptions and methods used to calculate the total pension liability;
- Inputs to the discount rates; and
- Certain information about mortality assumptions and the dates of experience studies.

## **GASB STATEMENT NO. 67**

### **(CONTINUED)**

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Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- The composition of the pension plan's board and the authority under which benefit terms may be amended;
- A description of how fair value is determined;
- Information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables and insurance contracts excluded from plan assets; and
- Annual money-weighted rate of return.

#### **Required Supplementary Information**

GASB Statement No. 67 requires a 10-year fiscal history of:

- Sources of changes in the net pension liability;
- Information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- A comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

#### **Timing of the Actuarial Valuation**

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2016, and a measurement date of June 30, 2016.

#### **Single Discount Rate**

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year mixed maturity general obligation bonds with an average Standard & Poor's Corp.'s AA credit rating (which is published by the Bond Buyer Index) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 8.00%; the municipal bond rate is 2.85% (based on the most recent date available on or before the measurement date of the "20-Bond GO Index" from the Bond Buyer Index); and the resulting Single Discount Rate is 8.00%.

#### **Effective Date and Transition**

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014, respectively.

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# GASB STATEMENT NO. 67

## Executive Summary as of June 30, 2016

	Main System	Judges	Law Enforcement with Prior Main Service	Law Enforcement without Prior Main Service	Total
Actuarial Valuation Date	07/01/2016	07/01/2016	07/01/2016	07/01/2016	07/01/2016
Measurement Date of the Net Pension Liability	07/01/2016	07/01/2016	07/01/2016	07/01/2016	07/01/2016
Plan's Fiscal Year Ending Date (Reporting Date) for GASB 67	06/30/2016	06/30/2016	06/30/2016	06/30/2016	06/30/2016
<b>Membership</b>					
Number of					
- Retirees and Beneficiaries	10,394	43	79	2	10,518
- Inactive, Nonretired Members	10,460	4	206	63	10,733
- Active Members	22,762	56	498	100	23,416
- Total	43,616	103	783	165	44,667
Covered Payroll	\$ 1,007,764,043	\$ 7,937,062	\$ 28,225,868	\$ 4,621,494	\$ 1,048,548,467
<b>Net Pension Liability</b>					
Total Pension Liability	\$ 3,299,381,100	\$ 39,819,443	\$ 53,865,148	\$ 3,499,776	\$ 3,396,565,467
Plan Fiduciary Net Position	2,324,783,623	44,269,616	42,406,694	3,435,724	2,414,895,657
Net Pension Liability	\$ 974,597,477	\$ (4,450,173)	\$ 11,458,454	\$ 64,052	\$ 981,669,810
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	70.46 %	111.18 %	78.73 %	98.17 %	71.10 %
Net Pension Liability as a Percentage of Covered Payroll	96.71 %	(56.07)%	40.60 %	1.39 %	93.62 %
<b>Development of the Single Discount Rate</b>					
Single Discount Rate	8.00 %	8.00 %	8.00 %	8.00 %	8.00 %
Long-Term Expected Rate of Investment Return	8.00 %	8.00 %	8.00 %	8.00 %	8.00 %
Long-Term Municipal Bond Rate*	2.85 %	2.85 %	2.85 %	2.85 %	2.85 %
Last year ending June 30 in the 2016 to 2115 projection period for which projected benefit payments are fully funded	2115	2115	2115	2115	2115

\*Source: "20-Bond GO Index" is the Bond Buyer Index, general obligation, 20 years to maturity, mixed quality. In describing this index, the Bond Buyer notes that the bonds' average credit quality is roughly equivalent to Moody's Investors Service's Aa2 rating and Standard & Poor's Corp.'s AA. The rate shown is as of June 30, 2016, the most recent date available on or before the measurement date.

# GASB STATEMENT NO. 67

## Schedules of Required Supplementary Information Schedule of Net Pension Liability and Related Ratios Multiyear

### Last 10 Fiscal Years (which may be built prospectively)

FY Ending 30-Jun	System	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2014	Main	\$ 2,846,579,777	\$ 2,211,858,402	\$ 634,721,375	77.70 %	\$ 865,868,265	73.30 %
2014	Judges	38,989,792	42,713,635	(3,723,843)	109.55 %	6,598,981	(56.43)%
2014	Law Enforcement with prior Main System service	30,791,599	24,806,508	5,985,091	80.56 %	13,394,927	44.68 %
2014	Law Enforcement without prior Main System service	2,190,975	2,204,318	(13,343)	100.61 %	2,589,887	(0.52)%
2014	Total PERS	2,918,552,143	2,281,582,863	636,969,280	78.18 %	888,452,060	71.69 %
2015	Main	\$ 2,976,071,808	\$ 2,296,088,880	\$ 679,982,928	77.15 %	\$ 946,197,522	71.86 %
2015	Judges	39,381,443	44,137,412	(4,755,969)	112.08 %	6,964,502	(68.29)%
2015	Law Enforcement with prior Main System service	34,317,782	28,691,976	5,625,806	83.61 %	16,732,974	33.62 %
2015	Law Enforcement without prior Main System service	2,675,506	2,792,541	(117,035)	104.37 %	3,641,404	(3.21)%
2015	Total PERS	3,052,446,539	2,371,710,809	680,735,730	77.70 %	973,536,402	69.92 %
2016	Main	\$ 3,299,381,100	\$ 2,324,783,623	\$ 974,597,477	70.46 %	\$ 1,007,764,043	96.71 %
2016	Judges	39,819,443	44,269,616	(4,450,173)	111.18 %	7,937,062	(56.07)%
2016	Law Enforcement with prior Main System service	53,865,148	42,406,694	11,458,454	78.73 %	28,225,868	40.60 %
2016	Law Enforcement without prior Main System service	3,499,776	3,435,724	64,052	98.17 %	4,621,494	1.39 %
2016	Total PERS	3,396,565,467	2,414,895,657	981,669,810	71.10 %	1,048,548,467	93.62 %

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

Values prior to July 1, 2016, were calculated by the prior actuary.

# GASB STATEMENT NO. 67

## Schedule of Changes in Net Pension Liability and Related Ratios Current Report Period Fiscal Year Ended June 30, 2016

Fiscal Year Ending June 30, 2016	Main System	Judges	Law Enforcement		Total PERS
			with Prior Main System service	without Prior Main System service	
<b>Total pension liability</b>					
Service cost	\$ 122,308,342	\$ 1,322,507	\$ 2,215,447	\$ 597,633	\$ 126,443,929
Interest on the total pension liability	237,161,626	3,117,401	2,770,436	235,321	243,284,784
Changes of benefit terms	0	0	0	0	0
Difference between expected and actual experience <sup>1</sup>	1,359,471	(1,055,087)	15,660,049	(49,495)	15,914,938
Changes of assumptions <sup>2</sup>	108,344,338	(780,206)	479,280	96,006	108,139,418
Benefit payments and refunds	(145,864,485)	(2,166,615)	(1,577,846)	(55,195)	(149,664,141)
<b>Net change in total pension liability</b>	<b>323,309,292</b>	<b>438,000</b>	<b>19,547,366</b>	<b>824,270</b>	<b>344,118,928</b>
<b>Total pension liability - beginning</b>	<b>2,976,071,808</b>	<b>39,381,443</b>	<b>34,317,782</b>	<b>2,675,506</b>	<b>3,052,446,539</b>
<b>Total pension liability - ending (a)</b>	<b>\$ 3,299,381,100</b>	<b>\$ 39,819,443</b>	<b>\$ 53,865,148</b>	<b>\$ 3,499,776</b>	<b>\$ 3,396,565,467</b>
<b>Plan fiduciary net position</b>					
Contributions - Employer	\$ 72,960,488	\$ 1,364,327	\$ 2,384,097	\$ 371,664	\$ 77,080,576
Contributions - Employee	71,996,797	622,985	1,342,588	255,906	74,218,276
Contributions - Service credit repurchases	8,905,606	111,586	98,463	63,508	9,179,163
Pension plan net investment income	10,654,377	211,606	173,027	15,016	11,054,026
Benefit payments and refunds	(145,864,485)	(2,166,615)	(1,577,846)	(55,195)	(149,664,141)
Pension plan administrative expense	(2,481,187)	(11,685)	(37,211)	(7,716)	(2,537,799)
Transfers and Other Income	12,523,147	-	11,331,600	-	23,854,747
<b>Net change in plan fiduciary net position</b>	<b>28,694,743</b>	<b>132,204</b>	<b>13,714,718</b>	<b>643,183</b>	<b>43,184,848</b>
<b>Plan fiduciary net position - beginning</b>	<b>2,296,088,880</b>	<b>44,137,412</b>	<b>28,691,976</b>	<b>2,792,541</b>	<b>2,371,710,809</b>
<b>Plan fiduciary net position - ending (b)</b>	<b>\$ 2,324,783,623</b>	<b>\$ 44,269,616</b>	<b>\$ 42,406,694</b>	<b>\$ 3,435,724</b>	<b>\$ 2,414,895,657</b>
<b>Net pension liability - ending (a) - (b)</b>	<b>\$ 974,597,477</b>	<b>\$ (4,450,173)</b>	<b>\$ 11,458,454</b>	<b>\$ 64,052</b>	<b>\$ 981,669,810</b>
<b>Plan fiduciary net position as a percentage of total pension liability</b>	70.46 %	111.18 %	78.73 %	98.17 %	71.10 %
<b>Covered-employee payroll</b>	\$ 1,007,764,043	\$ 7,937,062	\$ 28,225,868	\$ 4,621,494	\$ 1,048,548,467
<b>Net pension liability as a percentage of covered-employee payroll</b>	96.71 %	(56.07)%	40.60 %	1.39 %	93.62 %

<sup>1</sup> Includes liability attributable to transfer of members.

<sup>2</sup> Includes difference in liability due to change in actuary.

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## GASB STATEMENT NO. 67

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### Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

The following presents the net pension liability/(asset) of the PERS, calculated using the current discount rate of 8.00%, as well as what the PERS's net pension liability/(asset) would be if it were calculated using a discount rate that is 1-percentage point lower (7.00%) or is 1-percentage point higher (9.00%) than the current rate.

<u>System</u>	1% Decrease	Current Single Discount Rate Assumption	1% Increase
	7.00%	8.00%	9.00%
<b>Main System</b>	\$1,382,447,698	\$974,597,477	\$630,962,500
<b>Judges</b>	(679,415)	(4,450,173)	(7,713,575)
<b>Law Enforcement</b>			
<b>With Main System Service</b>	18,808,267	11,458,454	5,392,846
<b>Without Main System Service</b>	581,682	64,052	(346,534)
<b>Total PERS</b>	1,401,158,232	981,669,810	628,295,237

# GASB STATEMENT NO. 67

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## System Asset Allocation

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-Term Expected Real Rate of Return</u>	<u>Allocation-Weighted Long-Term Expected Real Rate of Return</u>
Domestic Equities	31.00 %	6.60 %	2.05 %
International Equities	21.00 %	7.30 %	1.53 %
Private Equity	5.00 %	10.90 %	0.55 %
Domestic Fixed Income	17.00 %	1.49 %	0.25 %
Int'l Fixed Income-Developed Investment Grade	5.00 %	(0.45)%	(0.02)%
Global Real Assets	20.00 %	5.24 %	1.05 %
Cash Equivalents	1.00 %	0.00 %	0.00 %
<b>Total</b>	<u>100.00 %</u>		<u>5.40 %</u>

*Expected return by asset class and target allocation provided by investment consultant.*

The discount rate used to measure the total pension liability was 8.00%. The projection of cash flows used to determine the discount rate assumed plan member and statutory/Board approved employer contributions will be made at rates equal to those based on the July 1, 2016, and July 1, 2015, PERS actuarial valuation reports. For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs of future plan members and their beneficiaries are not included. Based on those assumptions, the pension plan's fiduciary net position was projected to be sufficient to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

## GASB STATEMENT NO. 67

FY Ending 30-Jun	System	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll*	Actual Contribution as a % of Covered Payroll
2014	Main	\$ 105,092,504	\$ 58,872,974	\$ 46,219,530	\$ 865,868,265	6.80%
2014	Judges	1,099,249	1,159,604	(60,355)	6,598,981	17.57%
2014	Law Enforcement with prior Main System service	1,449,458	1,385,958	63,500	13,394,927	10.35%
2014	Law Enforcement without prior Main System service	210,115	242,514	(32,399)	2,589,887	9.36%
2014	Total PERS	107,851,326	61,661,050	46,190,276	888,452,060	6.94%
2015	Main	\$ 104,636,238	\$ 67,669,374	\$ 36,966,864	\$ 946,197,522	7.15%
2015	Judges	1,030,705	1,225,358	(194,653)	6,964,502	17.59%
2015	Law Enforcement with prior Main System service	1,577,004	1,638,384	(61,380)	16,732,974	9.79%
2015	Law Enforcement without prior Main System service	270,026	309,419	(39,393)	3,641,404	8.50%
2015	Total PERS	107,513,973	70,842,535	36,671,438	973,536,402	7.28%
2016	Main	\$ 121,358,455	\$ 72,960,487	\$ 48,397,968	\$ 1,007,764,043	7.24%
2016	Judges	781,713	1,364,327	(582,614)	7,937,062	17.19%
2016	Law Enforcement with prior Main System service	1,828,196	2,384,097	(555,901)	28,225,868	8.45%
2016	Law Enforcement without prior Main System service	367,803	371,664	(3,861)	4,621,494	8.04%
2016	Total PERS	124,336,167	77,080,576	47,255,591	1,048,548,467	7.35%

<sup>1</sup> Prior to the valuation as of July 1, 2016, annual payroll is based on projected annual compensation for the upcoming year. Beginning with the valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the valuation date.

Values prior to July 1, 2016, were calculated by the prior actuary.

# GASB STATEMENT NO. 67

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**Valuation Date:** July 1, 2016  
**Notes** The actuarially determined contribution amount is calculated as of June 30, 12 months prior to the end of the fiscal year in which the contributions are reported.

**Methods and Assumptions Used to Determine Actuarially Determined Contribution Rates:**

Actuarial Cost Method Entry Age Normal  
Amortization Method Level Percentage of Payroll, Open Period  
Assumed annual payroll growth of 4.50% (4.00% for Judges)  
Remaining Amortization Period 20 years  
Asset Valuation Method The asset value is the actuarial value of assets which is calculated by recognizing 100 percent of the current year's interest and dividends and 20 percent of the current year and previous four years' total appreciation/(depreciation). The total appreciation/(depreciation) for a given year is fully recognized after a five-year period. The current asset valuation method has a systematic bias toward the actuarial value of assets being lower than the market value of assets.  
Inflation 3.50 percent  
Salary Increases 4.00 percent to 20.00 percent including inflation.  
Investment Rate of Return 8.00%  
Retirement Age Age-based table of rates that are specific to the type of eligibility condition.  
Mortality RP 2000 Combined Healthy Mortality table, sex-distinct, with rates set back 2 years for males and 3 years for females. RP 2000 Disabled Mortality table, sex-distinct, with rates set back 1 years for males (no setback for females), with rates multiplied by 125% for post-retirement disabled mortality. Mortality rates are projected from 2014 using the Social Security Administration (SSA) Intermediate Cost scale.

**Other Information:**

**Notes** There were no benefit changes during the year.  
There were no assumptions changes during the year.  
The actuarial assumptions were adopted by the Board and are based on an experience study covering the period July 1, 2009, through June 30, 2014.

**Methods and Assumptions Used to Determine GASB 67/68 Net Pension Liability:**

Actuarial Cost Method Entry Age Normal  
Asset Valuation Method Plan Fiduciary Net Position (Market value of assets, no asset smoothing)  
Inflation 3.50 percent  
Salary Increases 4.00 percent to 20.00 percent including inflation.  
Investment Rate of Return 8.00%  
Retirement Age Age-based table of rates that are specific to the type of eligibility condition.  
Mortality RP 2000 Combined Healthy Mortality table, sex-distinct, with rates set back 2 years for males and 3 years for females. RP 2000 Disabled Mortality table, sex-distinct, with rates set back 1 years for males (no setback for females), with rates multiplied by 125% for post-retirement disabled mortality. Mortality rates are projected from 2014 using the Social Security Administration (SSA) Intermediate Cost scale.

**Other Information:**

**Notes** There were no benefit changes during the year.  
There were no assumptions changes during the year.  
The actuarial assumptions were adopted by the Board and are based on an experience study covering the period July 1, 2009, through June 30, 2014.  
The employer rates to the System are the statutory/Board approved contribution rates of 7.12% of payroll for the Main System, 17.52% for the Judges System, 9.81% for Law Enforcement with prior Main System service System, and 7.93% for Law Enforcement without prior Main System service System.

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**SECTION E**

ACTUARIAL VALUATION PROCEDURES

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## **ACTUARIAL ASSUMPTIONS IN THE ACTUARIAL VALUATION PROCESS**

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*Normal cost and the allocation of benefit values* between service rendered before and after the valuation date were determined using the *Individual Entry Age Normal* actuarial cost method having the following characteristics:

- The normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and
- Each annual normal cost is a constant percentage of the member's year by year projected covered pay.

*Financing of Unfunded Actuarial Accrued Liabilities.* The unfunded actuarial accrued liability is amortized using 20-year open level-percentage of pay amortization of the unfunded liability as of the valuation date.

*Actuarial Value of Pension Plan Assets.* The asset value is the actuarial value of assets which is calculated by recognizing 100 percent of the current year's interest and dividends and 20 percent of the current year and previous four years' total appreciation/(depreciation). The total appreciation/(depreciation) for a given year is fully recognized after a five-year period.

The current asset valuation method has a systematic bias toward the actuarial value of assets being lower than the market value of assets.

### ***Actuarial Valuation Assumptions***

The contribution and benefit values of the System are calculated by applying actuarial assumptions to the benefit provisions and census information furnished, using the actuarial cost method described above.

The principal areas of financial risk which require assumptions about future experiences are:

- Long-term rates of investment return to be generated by the assets of the Plan;
- Patterns of pay increases to members;
- Rates of mortality among members, retirees and beneficiaries;
- Rates of withdrawal of active members;
- Rates of disability among members; and
- The age patterns of actual retirement.

In an actuarial valuation, the monetary effect of each assumption is calculated for as long as a present covered person survives; a period of time which can be as long as a century.

Actual experience of the Plan will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

## **ACTUARIAL ASSUMPTIONS IN THE ACTUARIAL VALUATION PROCESS (CONTINUED)**

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From time-to-time it becomes appropriate to modify one or more of the assumptions, to reflect experience trends (but not random year-to-year fluctuations). Thus, an experience review of the North Dakota Public Employees Retirement System for the period July 1, 2009, to July 1, 2014, was performed by the prior actuary to compare the demographic and economic experience against the actuarial assumptions used in the valuations. The actuarial assumptions described in this section were adopted by the Board for use beginning with the July 1, 2015, valuation. Additional information regarding the rationale for the assumptions may be found in the 2015 experience review report. The experience review was performed by the prior actuary. All actuarial assumptions are expectations of future experience, not current market measures.

The assumptions were provided by, and are the responsibility of, the NDPERS Board. GRS was unable to judge the reasonableness of the assumptions and methods without performing a substantial amount of additional work beyond the scope of the assignment, and did not do so.

## ACTUARIAL VALUATION ASSUMPTIONS

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### Current Actuarial Valuation Assumptions and Methods

The assumed rate of investment return used was 8.00 percent, net of investment expenses, annually.

The assumed rate of price inflation is 3.50 percent.

No Cost of Living Adjustments (COLA) are provided to benefits recipients. Therefore, there is no COLA assumption for this valuation.

The rates of annual salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefit amounts will be based.

<u>Service At Beginning of Year</u>	<u>State Employee</u>	<u>Non-State Employee</u>	<u>Law Enforcement</u>	<u>Judges</u>
0	12.00%	15.00%	20.00%	
1	9.50%	10.00%	20.00%	
2	7.25%	8.00%	20.00%	
3			10.00%	
4			10.00%	
<u>Age*</u>				
Under 30	7.25%	10.00%	7.25%	4.00%
30-39	6.50%	7.50%	6.50%	4.00%
40-49	6.25%	6.75%	6.25%	4.00%
50-59	5.75%	6.50%	5.75%	4.00%
60+	5.00%	5.25%	5.00%	4.00%

*\*Age-based salary increase rates apply for employees with three or more years of service in the Main System, five or more years of service in the Law Enforcement Systems and for all employees in the Judges System.*

The assumed rate of total payroll growth used in amortizing the unfunded liability as a level percentage of pay is:

Main System and Law Enforcement: 4.50 percent

Judges: 4.00 percent

**ACTUARIAL VALUATION ASSUMPTIONS  
(CONTINUED)**

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The mortality assumptions are as follows:

	<b>Male Setback</b>	<b>Female Setback</b>
RP-2000 Combined Healthy Mortality Table (healthy mortality)	2 years	3 years
RP-2000 Disabled Retiree Mortality Table (disabled post retirement)*	1 year	0 years

\*Rates multiplied by 125 percent.

To provide a margin for future mortality improvements, generational mortality improvements from the year 2014 using the Social Security Administration (SSA) 2014 Intermediate Cost scale were assumed.

Following is a table with the life expectancies by age as of the valuation date.

<b>Age</b>	<b>Healthy Mortality</b>		<b>Disabled Mortality</b>	
	<b>Future Life</b>		<b>Future Life</b>	
	<b>Expectancy (years) in 2016</b>		<b>Expectancy (years) in 2016</b>	
	<b>Men</b>	<b>Women</b>	<b>Men</b>	<b>Women</b>
20	67.65	72.06	32.27	49.75
25	62.25	66.64	30.36	45.90
30	56.86	61.22	28.35	41.98
35	51.49	55.82	26.21	37.97
40	46.17	50.44	23.85	33.83
45	40.91	45.11	21.15	29.52
50	35.70	39.83	18.27	25.27
55	30.58	34.64	15.76	21.51
60	25.63	29.56	13.57	18.22
65	20.97	24.71	11.54	15.22
70	16.74	20.23	9.58	12.45
75	12.92	16.11	7.73	9.95
80	9.60	12.46	6.12	7.79
85	6.86	9.28	4.81	5.97
90	4.78	6.69	3.63	4.49
95	3.40	4.89	2.55	3.40
100	2.59	3.85	1.92	2.76
105	2.15	3.13	1.60	2.14

**ACTUARIAL VALUATION ASSUMPTIONS  
(CONTINUED)**

**Rates of separation from active membership** are represented by the following table (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members terminating employment.

<b>Service and Age-Based Rates For First Five Years of Service</b>						
<b>Service Beginning of Year</b>	<b>Main System</b>			<b>Law Enforcement</b>		
	<b>Age</b>					
	<b>Under 30</b>	<b>30-39</b>	<b>40+</b>	<b>Under 30</b>	<b>30-39</b>	<b>40+</b>
0	22.00%	16.00%	12.00%	25.00%	20.00%	17.00%
1	18.00%	14.00%	10.00%	23.00%	17.00%	15.00%
2	16.00%	12.00%	10.00%	20.00%	15.00%	12.00%
3	14.00%	12.00%	8.00%	17.00%	13.00%	10.00%
4	14.00%	11.00%	7.00%	15.00%	11.00%	7.00%

<b>Age</b>	<b>Age-Based Rates Only After First Five Years of Service</b>	
	<b>Main System</b>	<b>Law Enforcement</b>
	20-24	8.80%
25-29	8.80%	8.80%
30-34	5.50%	5.50%
35-39	4.70%	4.70%
40-44	3.90%	3.90%
45-49	3.70%	3.70%
50-54	3.40%	3.40%
55-59	0.10%	0.10%
60+	0.20%	0.20%

No pre-retirement termination is assumed for Judges.

*Vested participants that terminate are assumed to elect the option with the greater present value:*

- 1) *A refund of their accumulated contributions with interest or*
- 2) *A deferred benefit.*

Withdrawal rates end upon eligibility for early retirement.

Early retirement eligibility is as follows:

**Main System:** Earlier of (i) age 55 and 3 years of service, and (ii) eligibility for Rule of 85. For members hired on or after 1/1/2016, earlier of (i) age 55 and 3 years of service, and (ii) eligibility for Rule of 90.

**Law Enforcement:** Age 50 and 3 years of service.

**Account Balance Due to Vested Employer Contribution (PEP):** Participation Under Chapter 54-52.2: If not elected: None. If elected: 100% of active members of the Main System and Law Enforcement.  
**Contribution:** Maximum allowed, based on service at the beginning of the Plan year.

**ACTUARIAL VALUATION ASSUMPTIONS  
(CONTINUED)**

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**Rates of disability:**

Before age 65: Males: 20% of OASDI disability incidence rates.  
 Females: 10% of OASDI disability incidence rates.

Age 65 and later: 0.25% per year.

**Rates of disability** were as follows:

<u>Age</u>	<u>All Plans</u>	
	<u>Male</u>	<u>Female</u>
20	0.0120%	0.0060%
25	0.0171%	0.0085%
30	0.0220%	0.0110%
35	0.0295%	0.0147%
40	0.0440%	0.0220%
45	0.0719%	0.0360%
50	0.1212%	0.0606%
55	0.2018%	0.1009%
60	0.3254%	0.1627%
65	0.2500%	0.2500%

**Social Security Disability (for Judges' disability benefit offset):**

Eligibility: 50%  
 Consumer Price Index Increases: 3.5% per annum  
 Wage Base Increases: 5.0% per annum

**Workers' Compensation (for Judges' disability benefit offset):**

None assumed.

**ACTUARIAL VALUATION ASSUMPTIONS  
(CONTINUED)**

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**Rates of retirement** for members eligible to retire during the next year were as follows:

<u>Age</u>	<u>Main System</u>		<u>Law Enforcement</u>	<u>Judges</u>
	<u>Reduced</u>	<u>Unreduced</u>	<u>Unreduced</u>	<u>Unreduced</u>
50		30.00%	25.00%	
51		10.00%	25.00%	
52		10.00%	25.00%	
53		10.00%	25.00%	
54		10.00%	25.00%	
55	1.00%	10.00%	10.00%	10.00%
56	1.00%	8.00%	10.00%	10.00%
57	1.00%	8.00%	10.00%	10.00%
58	1.00%	8.00%	10.00%	10.00%
59	1.00%	8.00%	10.00%	10.00%
60	2.00%	8.00%	10.00%	10.00%
61	5.00%	15.00%	10.00%	10.00%
62	10.00%	30.00%	50.00%	10.00%
63	10.00%	30.00%	50.00%	10.00%
64	10.00%	20.00%	50.00%	10.00%
65		30.00%	50.00%	20.00%
66		20.00%	20.00%	20.00%
67		15.00%	20.00%	20.00%
68		15.00%	20.00%	20.00%
69		15.00%	20.00%	20.00%
70		15.00%	20.00%	20.00%
71		15.00%	20.00%	20.00%
72		15.00%	20.00%	20.00%
73		15.00%	20.00%	20.00%
74		15.00%	20.00%	20.00%
75+		100.00%	100.00%	100.00%

## ACTUARIAL VALUATION ASSUMPTIONS (CONTINUED)

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**Assumed Service**

**Credit:**

All active members (full time and part time) are assumed to earn one full year of service for each assumed future year of service.

**Marital Status:**

It is assumed that 75 percent of participants in the Main System and Law Enforcement and 100 percent of Judges have an eligible spouse at the time of retirement or pre-retirement death. The male spouse is assumed to be three years older than the female spouse.

Spouses are assumed to be the opposite sex of the employees and retirees. The relatively low rate of same-sex spouses does not have a material actuarial impact on the actuarial valuation results.

<b>Form of Payment Election Assumption:</b>	<b>Form of Payment</b>	<b>Main System and Law Enforcement</b>	<b>Judges</b>
	Life Annuity	50%	0%
	50% Joint and Survivor	45%	100%
	Refund of Member Contributions	5%	0%

**Benefit Service:**

Exact fractional years of service are used to determine the amount of benefit payable.

**Decrement Timing:**

Retirement is assumed to occur at the beginning of the year. All decrements are assumed to occur at the middle of the year.

**Decrement**

**Operation:**

Turnover decrements do not operate after the member reaches retirement eligibility (early or normal).

**Eligibility Testing:**

Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.

**Pay Increase Timing:**

Beginning of (fiscal) year.

**ACTUARIAL VALUATION ASSUMPTIONS  
(CONTINUED)**

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**Expenses:** Assumed administrative expenses were added to the Normal Cost and are based on the prior year's expenses, adjusted for inflation. The assumed amount added to the Normal Cost is:

<b>Expenses</b>	<b>Main System</b>	<b>Judges</b>	<b>Law Enforcement</b>		<b>Total</b>
			<b>With Prior</b>	<b>Without Prior</b>	
Assumed FY 2016	\$ 2,400,044	\$ 11,559	\$ 29,842	\$ 7,402	\$ 2,448,847
Actual FY 2016	2,481,187	11,685	37,211	7,716	2,537,799
Assumed FY 2017	2,568,029	12,094	38,513	7,986	2,626,622

**Assumptions for  
Missing or**

**Incomplete Data:** Annual compensation for members with no pay or equal to \$100 or less was assumed to be \$44,831.

**Changes in Actuarial Valuation Assumptions and Methods Since the Previous Valuation**

There have been no changes in actuarial valuation assumptions or methods since the previous valuation as of July 1, 2015.

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**SECTION F**  
BENEFIT PROVISIONS

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## **BENEFIT PROVISIONS**

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This Section summarizes the major benefit provisions of the North Dakota Public Employees Retirement System as included in the actuarial valuation. It is not intended to be, nor should it be, interpreted as a complete statement of all plan provisions.

### **1. Normal Service Retirement:**

➤ **Eligibility:**

*Main System and Judges:*

Attainment of age 65, or at any age with age plus service equal to at least 85 (Rule of 85).

For members enrolled after December 31, 2015, into the Main System, attainment of age 65, or at age 60 with age plus service equal to at least 90 (Rule of 90).

*Law Enforcement:*

Attainment of age 55 and three consecutive years of service, or if not former National Guard, at any age with age plus service equal to at least 85 (Rule of 85). Former National Guard is eligible for Rule of 85 on August 1, 2015.

➤ **Benefit:**

*Main System and Law Enforcement:*

2.00% of final average salary multiplied by service.

*Judges:*

3.50% of final average salary for each of the first ten years of service, 2.80% for each of the next ten years of service, and 1.25% for service in excess of twenty years.

### **2. Early Retirement:**

➤ **Eligibility:**

*Main System:*

Attainment of age 55 with three years of service.

*Judges:*

Attainment of age 55 with five years of service.

*Law Enforcement:*

Attainment of age 50 with three years of service.

## BENEFIT PROVISIONS (CONTINUED)

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➤ Benefit:

Main System:

The Normal Service Retirement Benefit as determined above. A benefit that begins before age 65 (or Rule of 85, if earlier) is reduced by one-half of one percent for each month before the earlier of age 65 or the age at which the Rule of 85 is met.

For members enrolled after December 31, 2015, into the Main System, a benefit that begins before age 65 (or Rule of 90, if earlier) is reduced by 2/3% of one percent for each month before the earlier of age 65 or the age at which the Rule of 90 is met.

*Judges:*

The Normal Service Retirement Benefit as determined above. A benefit that begins before age 65 (or Rule of 85, if earlier) is reduced by one-half of one percent for each month before age 65 or the age at which the Rule of 85 is met.

*Law Enforcement:*

The Normal Service Retirement Benefit as determined above. A benefit that begins before age 55 (or Rule of 85, if earlier) is reduced by one-half of one percent for each month before age 55 or the age at which the Rule of 85 is met.

**3. Disability Benefit:**

➤ Eligibility:

Six months of service and inability to engage in any substantial gainful activity.

➤ Benefit:

*Main System and Law Enforcement:*

25% of the member's final average salary at disability minus workers' compensation benefits, with a minimum of \$100 per month.

*Judges:*

70% of the member's final average salary at disability minus Social Security and Workers' Compensation benefits paid.

## BENEFIT PROVISIONS (CONTINUED)

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### 4. Deferred Vested Retirement:

➤ Eligibility:

*Main System and Law Enforcement:*

Three years of service.

*Judges:*

Five years of service.

➤ Benefit:

*Main System and Judges:*

The Normal Service Retirement Benefit payable at age 65 or the Rule of 85, if earlier. Reduced early retirement benefits can be elected upon attainment of age 55.

*Law Enforcement:*

The Normal Service Retirement Benefit payable at age 55 or the Rule of 85, if earlier. Reduced early retirement benefit can be selected upon attainment of age 50.

### 5. Pre-Retirement Death Benefits:

(a) Vested participants with a surviving spouse

➤ Eligibility:

*Main System and Law Enforcement:*

Three years of service.

*Judges:*

Five years of service.

➤ Benefit:

*Main System and Law Enforcement:*

One of the following options:

- Lump sum payment of member's accumulated contributions with interest.

## BENEFIT PROVISIONS (CONTINUED)

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- 50% of the member's accrued benefit (not reduced on account of age) payable for the surviving spouse's lifetime.
- Continuation portion of 100% joint and survivor annuity (only if participant was eligible for normal retirement).
- A partial lump sum payment in addition to the one of the annuity options above.

*Judges:*

One of the following options:

- Lump sum payment of member's accumulated contributions with interest.
- 100% of the member's accrued benefit (not reduced on account of age) payable for the spouse's lifetime.

(b) Non-vested members or vested members without a surviving spouse

➤ Eligibility:

*Main System, Judges and Law Enforcement:*

Non-vested or no surviving spouse.

➤ Benefit:

*Main System, Judges and Law Enforcement:*

Lump sum payment of member's accumulated contributions with interest.

**6. Refund of Member Contributions:**

Paid to terminated non-vested members and terminated vested members who choose a refund of employee contributions in lieu of a monthly retirement benefit.

**7. Accumulated Member Contributions:**

Member contributions accumulate with interest at the following rates:

<u>Time Period</u>	<u>Per Annum Interest Rate</u>
Through June 30, 1981	5.0%
July 1, 1981, to June 30, 1986	6.0%
After June 30, 1986	0.5% less than the actuarial interest rate assumption

## **BENEFIT PROVISIONS (CONTINUED)**

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### **8. Standard and Optional Forms of Payment:**

Standard form of payment:

*Main System and Law Enforcement:*

Monthly benefit for life with a refund to beneficiary at death of the remaining balance (if any) of accumulated member contributions.

*Judges:*

Monthly benefit for life, with 50% payable to an eligible survivor.

Optional forms of payment:

- Life annuity (for Judges).
- 50% joint and survivor annuity with pop-up (for Main System and Law Enforcement).
- 100% joint and survivor annuity with pop-up.
- Twenty-year certain and life annuity.
- Ten-year certain and life annuity.
- Social Security level income annuity.
- A partial lump sum payment in addition to one of the annuity options above.
- An actuarially equivalent graduated benefit option with either a one percent or two percent increase to be applied the first day of January of each year. Not available for disability or early retirements or in combination with a partial lump sum option, a deferred normal retirement option, or a Social Security level income annuity.

### **9. Final Average Salary:**

Average of the highest salary received by the member for any 36 months employed during the last 180 months of employment.

### **10. Contributions:**

Contribution rates specified in the Century Code (except employer rate for Law Enforcement); differ between permanent full-time employees and part-time temporary employees. Rates are as follows:

**BENEFIT PROVISIONS  
(CONTINUED)**

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	<u>Rates Set by Statute</u>		<u>Rates Determined by the Board of Retirement</u>
	<u>Member</u>	<u>Employer</u>	<u>Employer</u>
	Main System Full-Time Employees	7.00%	7.12%
Main System Part-Time Employees	14.12%	0.00%	
Judges	8.00%	17.52%	
Law Enforcement with prior Main System service	5.50%		9.81%
➤ BCI Employees	6.00%		9.81%
➤ National Guard members	5.50%		9.81%
Law Enforcement without prior Main System service	5.50%		7.93%

Effective January 1, 2000:

A member's account balance includes vested employer contributions equal to the member's contributions to the deferred compensation Plan under chapter 54-52.2. The vested employer contribution may not exceed:

1. For months one through 12 of service credit, \$25 or 1% of the member's monthly salary, whichever is greater.
2. For months 13 through 24 of service credit, \$25 or 2% of the member's monthly salary, whichever is greater.
3. For months 25 through 36 of service credit, \$25 or 3% of the member's monthly salary, whichever is greater.
4. For service exceeding 36 months, \$25 or 4% of the member's monthly salary, whichever is greater.

Vested employer contributions are credited monthly to the member's account balance.

**11. Rollovers:**

The fund may accept rollovers from other qualified plans under rules adopted by the Board for the purchase of additional service credit.

**Changes in Plan Provisions Since the Previous Actuarial Valuation**

There have been no changes in plan provisions since the previous valuation as of July 1, 2015.

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## **SECTION G**

### **GLOSSARY OF TERMS**

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## GLOSSARY OF TERMS

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**Actuarial Accrued Liability (AAL).** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.”

**Actuarial Assumptions.** Estimates of future plan experience such as investment return, expected lifetimes and the likelihood of receiving a pension from the Pension Plan. Demographic, or “people” assumptions, include rates of mortality, retirement and separation. Economic, or “money” assumptions, include expected investment return, inflation and salary increases.

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**Actuarial Present Value of Future Plan Benefits.** The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

**Actuarial Value of Assets (AVA).** Smoothed value of assets that recognizes the difference between the expected investment return using the valuation assumption of 7.50 percent and the actual investment return over a five-year period. Dampens volatility of asset value over time.

**Amortization.** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

**Annual Required Contribution.** The sum of the normal cost and amortization of the unfunded actuarial accrued liability.

**Asset Return.** The net investment return for the asset divided by the mean asset value. Example: if \$1.00 is invested and yields \$1.08 after a year, the asset return is 8.00 percent.

**Funded Ratio.** The actuarial value of assets divided by the actuarial accrued liability. Measures the portion of the actuarial accrued liability that is currently funded.

**Market Value of Assets (MVA).** The value of assets currently held in the trust available to pay for benefits of the Pension Plan. Each of the investments in the trust is valued at market price which is the price at which buyers and sellers trade similar items in the open market.

**Normal Cost (NC).** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Unfunded Actuarial Accrued Liability (UAAL).** The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”