



**NORTH DAKOTA
PUBLIC EMPLOYEES
RETIREMENT SYSTEM**

**ACTUARIAL VALUATION AND REVIEW
AS OF JULY 1, 2015**

 Segal Consulting



5990 Greenwood Plaza Blvd, Suite 118 Greenwood Village, CO 80111
T 303.714.9900 www.segalco.com

October 26, 2015

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

Members of the Board:

We are pleased to submit this Actuarial Valuation and Review as of July 1, 2015 for the North Dakota Public Employees Retirement System (PERS). It summarizes the actuarial data used in the valuation, establishes the actuarially determined contribution requirements for the 2015-2016 plan year, and analyzes the preceding year's experience.

The census and financial information on which our calculations are based was provided by the Retirement Office staff. That assistance is gratefully acknowledged. The actuarial calculations were completed under the supervision of Tammy F. Dixon, FSA, MAAA, Enrolled Actuary.

This actuarial valuation has been completed in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.

We are members of the American Academy of Actuaries, and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

We look forward to meeting with you to review this report and to answering any questions you may have.

Sincerely,

Brad Ramirez, FSA, MAAA, FCA, EA
Vice President & Consulting Actuary

Tammy F. Dixon, FSA, MAAA, EA
Vice President & Actuary

Laura L. Mitchell, MAAA, EA
Vice President & Consulting Actuary

cc: Sparb Collins

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Introduction

This report has been prepared by Segal Consulting to present a valuation of the North Dakota Public Employees' Retirement System as of July 1, 2015. The valuation was performed to determine whether the assets and statutory contributions are anticipated to be sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

1. The present provisions of the North Dakota Public Employees Retirement System;
2. The characteristics of covered active members, inactive non-retired members, pensioners and beneficiaries as of July 1, 2015;
3. The assets of the System as of June 30, 2015; and
4. Economic assumptions regarding future salary increases and investment earnings and demographic assumptions regarding rates of termination, retirement, disability, death, etc.

The purpose of the actuarial valuation is to determine the contribution sufficient to meet the long-term obligations to the members covered by the North Dakota Public Employees Retirement System in accordance with the benefit provisions of the System. The measurements in this valuation are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation.

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

Highlights

- For the combined PERS Fund (Main System, Judges, and Law Enforcement), the present contribution rates are not sufficient to meet the actuarially determined requirement for 2015-2016, based upon the actuarial assumptions and financing objectives approved by the Board. If unchanged, this difference will further increase the actuarial contribution requirement in future valuations.
- The PERS Board has recommended contribution increases in recent legislative sessions and continues to review projected future performance to determine appropriate measures to mitigate the difference between the actuarial and statutory (or approved) contribution rates.
- The National Guard merged into Law Enforcement with Prior Main System service effective August 1, 2015.
- Based on the results of the Actuarial Experience Study completed in May 2015, the Board approved several changes to the actuarial assumptions. A description of these changes is shown in Exhibits II and III.
- The employer actuarial contribution requirements for 2015-2016 are as follows:

	Amount	Percentage of Payroll	Statutory/Approved Contribution Rate
Main System	\$121,358,455	12.21%	7.12%
Judges	781,713	10.75	17.52
Law Enforcement with prior Main System service ¹	1,828,196	9.78	9.81 ²
Law Enforcement without prior Main System service	367,803	8.03	7.93

- A comparison of this year's actuarial contribution requirements to last year's requirements as a percent of payroll follows:

	2015-2016	2014-2015
Main System	12.21%	11.06%
Judges	10.75	14.80
Law Enforcement with prior Main System service ³	9.78	9.42 ¹
Law Enforcement without prior Main System service	8.03	7.42

¹ Includes former National Guard members (increased from 7.00% to 9.81% as of August 1, 2015)

² Bureau of Criminal Investigation rate is 10.31%.

³ Includes former National Guard members

- The employer actuarial contribution requirement for the Main System for 2015-2016 is \$121,358,455, or 12.21% of payroll and exceeds the statutory rate of 7.12% of payroll as of the valuation date by 5.09%. Last year, the actuarial contribution requirement was 11.06%, and the deficit was 3.94%.
- Table 7 details actuarial gains and losses in the Main System for many of the measured demographic assumptions. The gain/(loss) by source is measured each year, and a detailed analysis of the System’s demographic assumptions is reviewed every fourth or fifth year by the completion of an experience study. The most recent experience study was completed in May 2015.
- The return on the market value of assets for 2015-2016 for the PERS Fund was 3.57%, compared to 16.14% for the preceding year. The return on the actuarial value of assets for 2015-2016 for the PERS Fund was 9.99% compared to the investment return assumption of 8.00%. As a result, the PERS Fund experienced an investment gain on an actuarial value basis of approximately \$37.9 million.
- A comparison of this year’s funded ratio to the prior year’s ratio is as follows:

	July 1, 2015	July 1, 2014
Actuarial Value of Assets	\$2,094,251,356	\$1,895,837,734
Actuarial Accrued Liability	\$3,052,446,539	\$2,938,752,157
Funded Ratio	68.6%	64.5%

- The ratio of the actuarial value of assets to the market value of assets for the PERS Fund is 88.3%. Last year, this ratio was 83.1%. The unrecognized appreciation represents \$277,459,453, or 11.7% of the PERS Fund market value of assets. A property of the asset smoothing method used by PERS is that the actuarial value of assets will tend to lag behind the market value of assets. The potential impact may be illustrated as follows:
 - If the unrecognized appreciation were recognized immediately in the actuarial value assets, the funded percentage would increase from 68.6% to 77.7%.
 - If the unrecognized appreciation were recognized immediately in the actuarial value of assets, the actuarial contribution requirement as a percent of payroll would decrease as follows:

	2015-2016 Actuarial Contribution Requirement	2015-2016 Contribution Reflecting Unrecognized Appreciation
Main System	12.21%	10.33%
Judges	10.75	5.59
Law Enforcement with prior Main System service	9.78	8.53
Law Enforcement without prior Main System service	8.03	7.53

- The Governmental Accounting Standards Boards (GASB) approved two Statements, 67 and 68. It is important to note that the GASB rules only redefine liabilities and pension expense for financial reporting purposes, and do not apply to contribution amounts for funding purposes. The information required by these statements will be provided in a separate report.
- The actuarial valuation report as of July 1, 2015 is based on financial and demographic information as of that date. Changes subsequent to that date are not reflected and could affect future actuarial costs of the Plan. We are prepared to work with the Board to analyze the effects of any subsequent developments.

Member Characteristics

Active Members

The age, service, compensation and contribution account balance information based on data provided by the Retirement Office for active members as of July 1, 2014 and July 1, 2015 is summarized below:

Category	Year Beginning July 1		Change From Prior Year
	2015	2014	
Main:			
Number	22,381	21,814	2.60%
Average age	46.5	46.7	N/A
Average service credit	9.7	10.1	N/A
Total projected compensation ¹	\$993,609,618	\$946,197,522	5.01%
Average projected compensation	43,395	43,376	0.04%
Contribution account balance	773,846,715	732,118,862	5.70%
Judges:			
Number	51	50	2.00%
Average age	58.7	58.7	N/A
Average service credit	15.5	16.8	N/A
Total projected compensation ¹	\$7,274,441	\$6,964,502	4.45%
Average projected compensation	142,636	139,290	2.40%
Contribution account balance	6,414,157	6,561,621	-2.25%
Law Enforcement with prior Main System service:²			
Number	318	315	0.95%
Average age	37.1	38.2	N/A
Average service credit	6.3	6.9	N/A
Total projected compensation ¹	\$18,692,512	\$16,732,974	11.71%
Average projected compensation	58,781	53,121	10.65%
Contribution account balance	6,765,213	6,827,406	-0.91%
Law Enforcement without prior Main System service:			
Number	95	83	14.46%
Average age	37.8	38.2	N/A
Average service credit	3.8	3.6	N/A
Total projected compensation ¹	\$4,579,348	\$3,641,404	25.76%
Average projected compensation	48,204	43,872	9.87%
Contribution account balance	1,276,114	1,004,240	27.07%
All active members:			
Number	22,845	22,262	2.62%
Average age	46.4	46.6	N/A
Average service credit	9.6	10.1	N/A
Total projected compensation ¹	\$1,024,155,919	\$973,536,402	5.20%
Average projected compensation	44,831	43,731	2.51%
Contribution account balance	788,302,199	746,512,129	5.60%

¹ Includes assumption change

² Includes former National Guard members

Distributions of the active members by age and service are presented in Table 9 of Appendix B. Table 10 presents a distribution of these same members by age and salary. The table below shows a breakdown of the active members who are currently eligible for benefits, as well as those who have not yet met the vesting requirements.

Active Members Eligible for:	Main System	Judges	Law Enforcement		Total
			With prior Main System Service ¹	Without prior Main System Service	
Retirement:					
Normal	816	9	33	5	863
Rule of 85	1,371	7	0	0	1,378
Early Retirement	<u>3,747</u>	<u>13</u>	<u>18</u>	<u>5</u>	<u>3,783</u>
Total Retirement	5,934	29	51	10	6,024
Deferred Retirement	<u>9,434</u>	<u>12</u>	<u>139</u>	<u>36</u>	<u>9,621</u>
Total vested	15,368	41	190	46	15,645
Nonvested	<u>7,013</u>	<u>10</u>	<u>128</u>	<u>49</u>	<u>7,200</u>
Total	22,381	51	318	95	22,845

Transfers

Some active and inactive members earned a portion of their service in a different system than they are currently in. Liabilities for these members are carried in each system based on their service in that system. The following table summarizes these members.

Original System	Current System					Total
	Main System	Judges	Law Enforcement		Highway Patrol	
			With prior Main System Service ¹	Without prior Main System Service		
Main System	-	22	124	31	36	213
Judges	2	-	-	-	-	2
Law Enforcement with prior Main System service ¹	42	-	-	2	2	46
Law Enforcement without prior Main System service	22	-	3	-	-	25
Highway Patrol	<u>12</u>	<u>-</u>	<u>3</u>	<u>-</u>	<u>-</u>	<u>15</u>
Total	78	22	130	33	38	301

¹ Includes former National Guard members

Inactive Members

There were 4,719 inactive members (including 1 from Judges, 76 from Law Enforcement with prior Main System service, and 21 from Law Enforcement without prior Main System service) as of July 1, 2015 who have elected to defer retirement benefits. The average deferred monthly benefit for vested members was \$442.

There were 4,466 inactive members who have elected to receive their retirement benefits immediately (due refunds). This group includes 1 from Judges, 50 from Law Enforcement with prior Main System service, and 8 from Law Enforcement without prior Main System service. Of this group, 442 members are eligible for retirement.

There were also 29 members from the Main System on leave of absence. For this group, a liability is carried for the deferred retirement benefits for 14 vested participants. The remaining 15 members from the Main System are valued as due refunds.

Retired Members

There were 9,193 pensioners and 867 beneficiaries receiving average monthly benefits of \$1,102 as of July 1, 2015. During the year ended June 30, 2015, 980 members were awarded a pension. Tables in Appendix B present the average monthly amounts and ages by type of pension for pensions awarded during the year ended June 30, 2015 and for all pensions in pay status as of June 30, 2015.

Additionally, there were 3 pensioners receiving benefits under the Special Prior Service Plan as shown in Appendix B.

Benefit Experience

New Awards

During the fiscal year ended in June 30, 2015, 980 pensions became effective. The average monthly benefit for these pensioners was \$1,666 and their average age at retirement was 63.2. Last year, the average benefit among new pensioners was \$1,350. The new pensioners are presented in Tables 11 and 12 in Appendix B by type of pension, monthly benefit, and age on retirement date.

A breakdown of the new pension awards by type compared to last year is as follows:

	<u>July 1, 2015</u>	<u>July 1, 2014</u>
Normal	386	336
Rule of 85	398	264
Early	168	175
Disability	<u>28</u>	<u>18</u>
Total	980	793

Pensioners

Since benefits became payable under the current retirement program, a total of 13,093 retirement pensions have been awarded, of which 9,193 remained on the June 2015 rolls (including 33 retired Judges and 65 retired members of the Law Enforcement). In addition, 28 pensions were in suspended status as of June 30, 2015. Distributions of the pensioners are presented in Tables 13 and 14 in Appendix B by type of pension, monthly benefit amount, and current age.

For the pensions in force on July 1, 2015, the average monthly benefit was \$1,444, an increase of \$372 from \$1,072 a year earlier. The average age of these pensioners on the valuation date was 71.8 years.

Beneficiaries

As of July 1, 2015, monthly benefit payments were being made to 867 beneficiaries (including 11 beneficiaries of Judges and 8 beneficiaries of Law Enforcement). The monthly payments to beneficiaries in payment status total \$590,985. Additionally, there were 34 alternate payees in pay status in the Main System.

Prior Service Pensioners

As of July 1, 2015, there were 3 pensioners receiving monthly benefits totaling \$31 under the Special Prior Service Pension provisions of the System. The current average age of Prior Service pensioners was 99.0 years, and the average monthly benefit was \$10. Because of the relatively high average age and low benefits, the liability for the Special Prior Service Pensioners represented less than 0.01% of the total actuarial accrued liability for the System. Tables 15 and 16 in Appendix B provide a breakdown of these pensioners by type of pension, monthly benefit amount, and current age.

Assets

Market Value of Assets

As shown in the draft financial statements as of June 30, 2015, the combined market value of net assets of the North Dakota Public Employees Retirement System (PERS) and Highway Patrolmen's Retirement System (HPRS) was \$2,438,386,537, an increase of \$91.1 million compared to \$2,347,301,808 a year earlier. This year's combined market value represents an increase of 3.9% from the market value one year earlier.

Based on schedules provided by the Retirement Office, the breakdown of the market value of net assets allocated to North Dakota PERS follows:

	July 1, 2015	July 1, 2014
Main System	\$ 2,296,088,880	\$2,211,910,482
Judges	44,137,412	42,713,635
Law Enforcement with prior Main System service ¹	28,691,976	24,806,508
Law Enforcement without prior Main System service	<u>2,792,541</u>	<u>2,204,318</u>
Total	\$2,371,710,809	\$2,281,634,943

The rate of return on the market value basis for the PERS Fund was 3.57% for the year ended June 30, 2015.

Actuarial Value of Assets

The actuarial value of assets is determined as follows:

Market appreciation and depreciation are spread over five years beginning with the year of occurrence. Interest and dividends are recognized immediately. This procedure results in recognition of all changes in market value over five years. A characteristic of this asset valuation method is that, over time, it is more likely than not to produce an actuarial value of assets that is less than the market value of assets, if the investment return attributable to net interest and dividends is less than the assumed rate of return.

The above procedure is applied to the combined assets of PERS and HPRS Retirement Income Funds to determine the combined actuarial value of the Systems. The combined actuarial value was \$2,153,126,887 as of June 30, 2015. The determination of the combined actuarial asset value is shown in Table 1. This table shows that there is approximately \$285 million of appreciation that will be recognized in future years.

¹ Includes former National Guard members

Table 2 summarizes the combined investment results over the previous ten-year period. Over this period, the earnings of \$1,021,147,300 on an actuarial value basis represented an average annual return of 6.35%. For the 2014-2015 year, the actuarial rate of return on the combined assets was 10.01%.

The total actuarial value of assets is allocated to PERS (Main System, Judges, and Law Enforcement) and HPRS in proportion to the reported market value of assets. This allocation is illustrated in Table 3 and summarized below for the PERS Fund alone.

	July 1, 2015	July 1, 2014
Main System	\$2,027,476,214	\$1,837,902,845
Judges	38,973,906	35,491,270
Law Enforcement with prior Main System service	25,335,386	20,612,025
Law Enforcement without prior Main System service	<u>2,465,850</u>	<u>1,831,594</u>
Total	\$2,094,251,356	\$1,895,837,734

Chart 1 on page 15 shows the historical asset values for the PERS Fund on both an actuarial and market value basis. This graph shows that the market value of assets is currently larger than the actuarial value.

Income and disbursements for 2015 and 2014 on an actuarial value basis are summarized in Table 4, and a summary statement of assets is shown in Table 5 for the PERS Fund. The progress of the PERS Fund for the last ten years is provided in Table 6. It shows that assets have generally increased from year to year, although the amount of the increase has varied with fluctuations in investment income. Benefit payments have also increased consistently over the period.

A picture of the financial development of the PERS Fund over the last ten years is provided in Chart 2 on page 19. It shows that benefit payments and expenses no longer exceed contributions. In addition, over the past ten years, the investment income has offset this deficit and served to increase the assets of the System.

Investment results on an actuarial value basis are used to determine whether investment experience is meeting the System's actuarially assumed return. They do not, however, necessarily indicate the relative success of the System's investment program. Comparisons of performance with benchmarks and market indices are generally based on rates of return that recognize market changes in full.

Investment Return

For your information the investment returns on market value and on an actuarial basis for the last ten years for the combined PERS and HPRS fund are shown below. The assumed rate of return is expected to be earned over the long term, as the obligations of pension plans are expected to continue for the lifetime of its active and inactive participants.

Year Ending June 30	Market Value	Actuarial Value
2006	12.04%	7.79%
2007	19.63	15.84
2008	(5.21)	8.51
2009	(24.05)	1.72
2010	13.25	1.48
2011	21.09	3.31
2012	(0.20)	(0.15)
2013	13.41	3.93
2014	16.15	12.20
2015	3.57	10.01

It is desirable to have a level and predictable pension plan cost from one year to the next. Under the asset valuation method, the full value of market fluctuations is not recognized in a single year, and, as a result, the asset value and the contribution requirements are more stable. Chart 3 on page 20 illustrates the smoothing effect that results from using an actuarial value of assets.

TABLE 1

*Determination of Actuarial Value of Assets
(for PERS and HPRS) as of June 30, 2015 and 2014*

Year Ending	Market Value Appreciation (Depreciation)*	June 30, 2015		June 30, 2014	
		Percent Deferred	Amount Deferred	Percent Deferred	Amount Deferred
June 30, 2011	\$288,857,273	0%	\$ 0	20%	57,771,455
June 30, 2012	(40,138,712)	20%	(8,027,742)	40%	(16,055,485)
June 30, 2013	200,819,548	40%	80,327,819	60%	120,491,729
June 30, 2014	293,366,241	60%	176,019,744	80%	234,692,993
June 30, 2015	46,174,786	80%	<u>36,939,829</u>	N/A	<u>N/A</u>
Total Deferred as of Valuation Date			\$285,259,650		\$396,900,691
(a) Total Appreciation (Depreciation) for last five Plan Years			789,079,136		895,909,010
(b) Write-Up/(Down) Amount for the year - equals 20% of (a)			157,815,827		179,181,802
			June 30, 2015		June 30, 2014
Market Value of Assets			\$2,438,386,537		\$2,347,301,808
Less: Deferred Appreciation (Depreciation)			<u>285,259,650</u>		<u>396,900,691</u>
Actuarial value of assets			\$2,153,126,887		\$1,950,401,117
Actuarial Value as a Percent of Market Value			88.3%		83.1%
* Interest and dividends are recognized immediately. Realized and unrealized appreciation (depreciation) is spread over five years.					

TABLE 2

Summary of Combined Investment Results for PERS and HPRS on Actuarial Value of Assets

Year Ended June 30	Net Interest and Dividend Income ¹		Other Income ²		Total Net Investment Income	
	Amount	Yield	Amount	Yield	Amount	Yield
2006	\$24,410,600	1.93%	\$73,910,900	5.86%	\$98,321,500	7.79%
2007	34,727,000	2.58	178,771,700	13.26	213,498,700	15.84
2008	32,819,700	2.13	98,332,000	6.38	131,151,700	8.51
2009	29,260,400	1.77	(964,400)	(0.05)	28,296,000	1.72
2010	25,938,200	1.57	(1,337,500)	(0.09)	24,600,700	1.48
2011	28,830,100	1.74	26,013,200	1.57	54,843,300	3.31
2012	36,570,500	2.17	(39,020,800)	(2.32)	(2,450,300)	(0.15)
2013	37,884,500	2.27	27,803,800	1.66	65,688,300	3.93
2014	32,503,200	1.87	179,181,800	10.33	211,685,000	12.20
2015	37,696,600	1.93	157,815,800	8.08	195,512,400	10.01
Total for Last Ten Years	\$320,640,800		\$700,506,500		\$1,021,147,300	
Average Yield for last Ten Years						6.35%

¹ Net of investment expenses.

² Includes write-up (down).

TABLE 3*Allocation of Combined (PERS and HPRS) Actuarial Value of Assets*

	July 1, 2015		July 1, 2014	
	Market Value	Actuarial Value	Market Value	Actuarial Value
PERS Main System	\$ 2,296,088,880	\$2,027,476,214	\$2,211,910,481	\$1,837,908,845
PERS Judges	44,137,412	38,973,906	42,713,635	35,491,270
PERS Law Enforcement with prior Main System service ¹	28,691,976	25,335,386	24,806,509	20,612,025
PERS Law Enforcement without prior Main System service	<u>2,792,541</u>	<u>2,465,850</u>	<u>2,204,318</u>	<u>1,831,594</u>
PERS Combined	\$2,371,710,809	\$2,094,251,356	\$2,281,634,943	\$1,895,837,734
Highway Patrol	<u>66,675,728</u>	<u>58,875,531</u>	<u>65,666,865</u>	<u>54,563,383</u>
Total	\$2,438,386,537	\$2,153,126,887	\$2,347,301,808	\$1,950,401,117

Note: Allocation of the actuarial value of assets is in proportion to the market value of assets.

¹ *Includes former National Guard members.*

CHART 1

Market Value of Assets vs. Actuarial Value of Assets for PERS

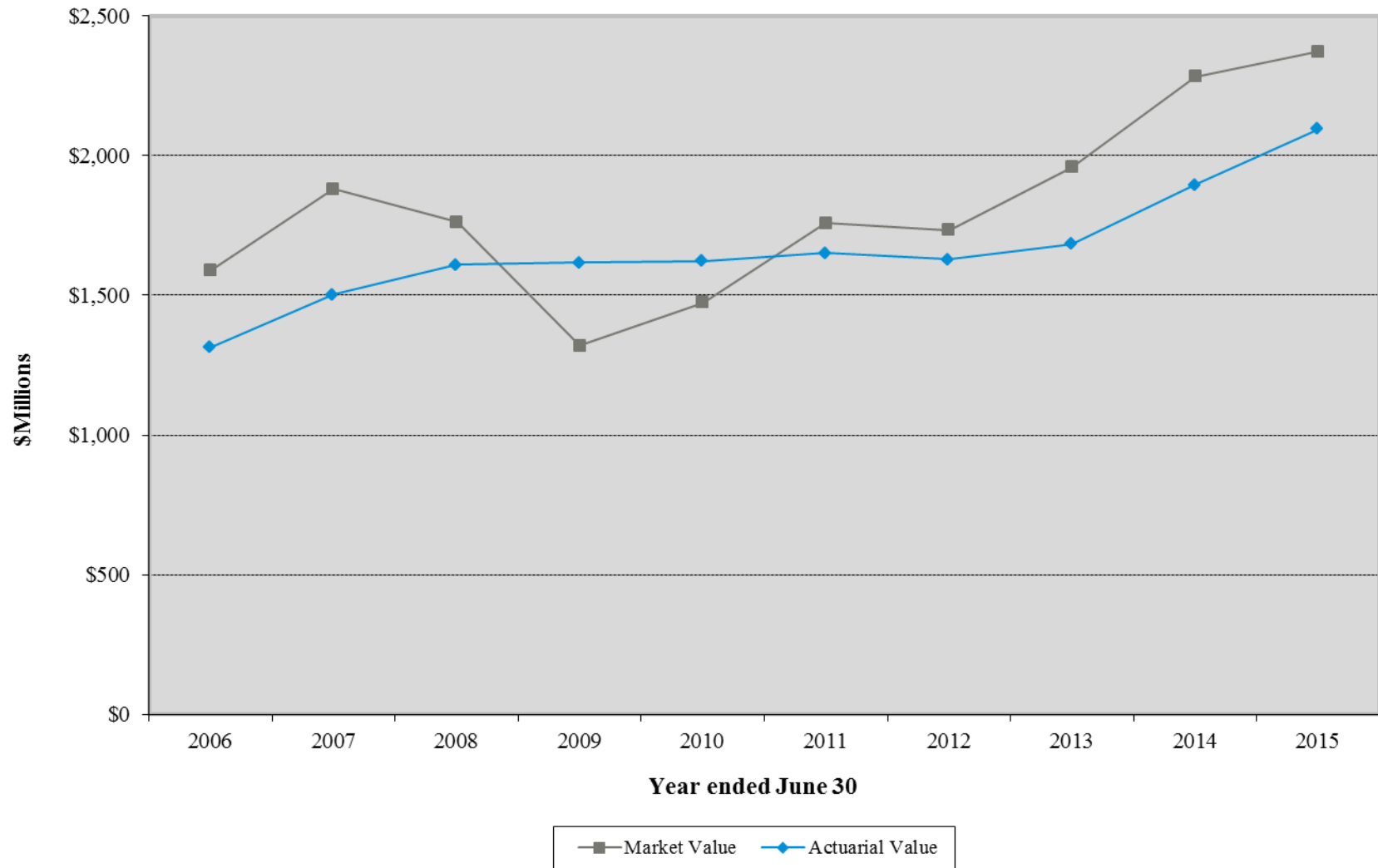


TABLE 4
Summary Statement of Income and Disbursements for PERS
on an Actuarial Value Basis

	Year Ended June 30, 2015	Year Ended June 30, 2014
Contribution Income:		
Employer Contributions	\$70,842,535	\$61,661,050
Member Contributions	68,392,061	59,394,200
Service Credit Repurchases	<u>6,651,879</u>	<u>8,325,140</u>
Total Contribution Income	\$145,886,475	\$129,380,390
Less: Administrative Expenses	<u>(2,365,357)</u>	<u>(2,158,712)</u>
Net Contribution Income	\$143,521,118	\$127,221,678
Investment Income:		
Interest and Dividends	\$44,597,780	\$39,772,701
Less: Investment Expenses	<u>(7,948,837)</u>	<u>(8,191,090)</u>
Net Interest and Dividends	\$36,648,943	\$31,581,611
Write-up/(down) of Assets	<u>153,325,378</u>	<u>173,962,242</u>
Net Investment Income	<u>\$189,874,321</u>	<u>\$205,543,853</u>
Total Income Available for Benefit Payments and Reserves	<u>\$333,395,439</u>	<u>\$332,765,531</u>
Benefit Payments:		
Pension Benefits	\$(127,179,525)	\$(113,300,699)
Transfers to Other Plans	(584,727) ¹	(347,783)
Refunds	<u>(7,217,565)</u>	<u>(6,237,842)</u>
Total Benefit Payments	<u>\$(134,981,817)</u>	<u>\$(119,886,324)</u>
Addition to Reserve for Future Benefit Payments	\$198,413,622	\$212,879,207
Actuarial Value of Assets, Start of Year	<u>1,895,837,734</u>	<u>1,682,958,527</u>
Actuarial Value of Assets, End of Year	<u>\$2,094,251,356</u>	<u>\$1,895,837,734</u>

¹ Includes adjustment from draft to final assets as of June 30, 2014.

TABLE 5**Summary Statement of Assets for PERS
(based on unaudited financial statements)**

	Year Ended June 30, 2015		Year Ended June 30, 2014	
Cash		\$7,700,778		\$5,991,879
Receivables:				
Contribution receivable	\$10,097,551		\$10,197,356	
Interest receivable	4,462,618		3,259,339	
Due from fiduciary funds	205,726		272,233	
Due from other state agencies	<u>460</u>		<u>19,000</u>	
Total receivables		14,766,355		13,747,928
Investments:				
Domestic equities	\$535,968,006		\$509,920,969	
International equities	727,089,759		695,332,269	
Domestic fixed income	430,301,685		421,096,933	
Real estate	418,669,456		396,107,838	
International fixed income	113,819,290		112,293,730	
Alternative investments	86,518,762		103,079,973	
Invested cash	<u>39,067,851</u>		<u>25,947,939</u>	
Total investments		2,351,434,809		2,263,779,651
Other pre-paid expenses		276		0
Software (net of amortization)		<u>2,043,278</u>		<u>2,426,891</u>
Total assets		\$2,375,945,496		\$2,285,946,349
Liabilities:				
Accounts payable	\$(4,012,487)		\$(4,077,820)	
Accrued compensated absences	(96,412)		(94,355)	
Salaries payable	(91,535)		(87,106)	
Due to proprietary funds	(19,029)		(31,160)	
Due to other state agencies	(13,376)		(8,473)	
Due to fiduciary funds	<u>(1,878)</u>		<u>(12,492)</u>	
Total liabilities		(4,234,687)		(4,311,406)
Net assets at market value		<u>\$2,371,710,809</u>		<u>\$2,281,634,943</u>
Net assets at actuarial value		<u>\$2,094,251,356</u>		<u>\$1,895,837,734</u>

TABLE 6***Progress of the PERS Fund through June 30, 2015
on an Actuarial Value Basis***

Year Ended June 30	Employer Contributions	Member Contributions¹	Administrative Expenses	Net Investment Income	Transfers From/(To) Other Plans	Benefit Payments and Refunds	Fund at End Of Year
2005							\$1,236,114,135
2006	\$21,969,517	\$24,508,623	\$(1,037,535)	\$95,085,991	\$(41,271)	\$(62,056,555)	1,314,542,905
2007	23,140,767	25,562,617	(1,109,260)	206,643,922	(39,829)	(65,601,228)	1,503,139,894
2008	25,253,902	27,351,026	(1,118,233)	126,989,439	3,132,512	(74,938,198)	1,609,810,342
2009	27,705,267	29,970,355	(1,260,812)	27,509,459	(496,073)	(76,090,737)	1,617,147,801
2010	30,253,093	32,584,909	(1,214,733)	23,989,771	(210,638)	(80,827,104)	1,621,723,099
2011	32,278,056	34,277,035	(1,797,287)	53,223,596	(264,686)	(88,976,102)	1,650,463,711
2012	38,005,854	42,587,266	(1,856,915)	(2,422,725)	(412,993)	(98,968,562)	1,627,395,636
2013	48,846,796	54,285,278	(2,059,315)	63,782,233	(212,500)	(109,079,601)	1,682,958,527
2014	61,661,050	67,719,340	(2,158,712)	205,543,853	(347,783)	(119,538,541)	1,895,837,734
2015	70,842,535	75,043,940	(2,365,357)	189,874,321	(584,727) ²	(134,397,090)	2,094,251,356
Total for Last Ten Years	\$379,956,837	\$413,890,389	\$(15,978,159)	\$990,219,860	\$522,012	\$(910,473,718)	

¹ Includes repurchases of service credit.² Includes adjustment from draft to final assets as of June 30, 2014.

CHART 2

**Income and Disbursement for PERS
on an Actuarial Value Basis**

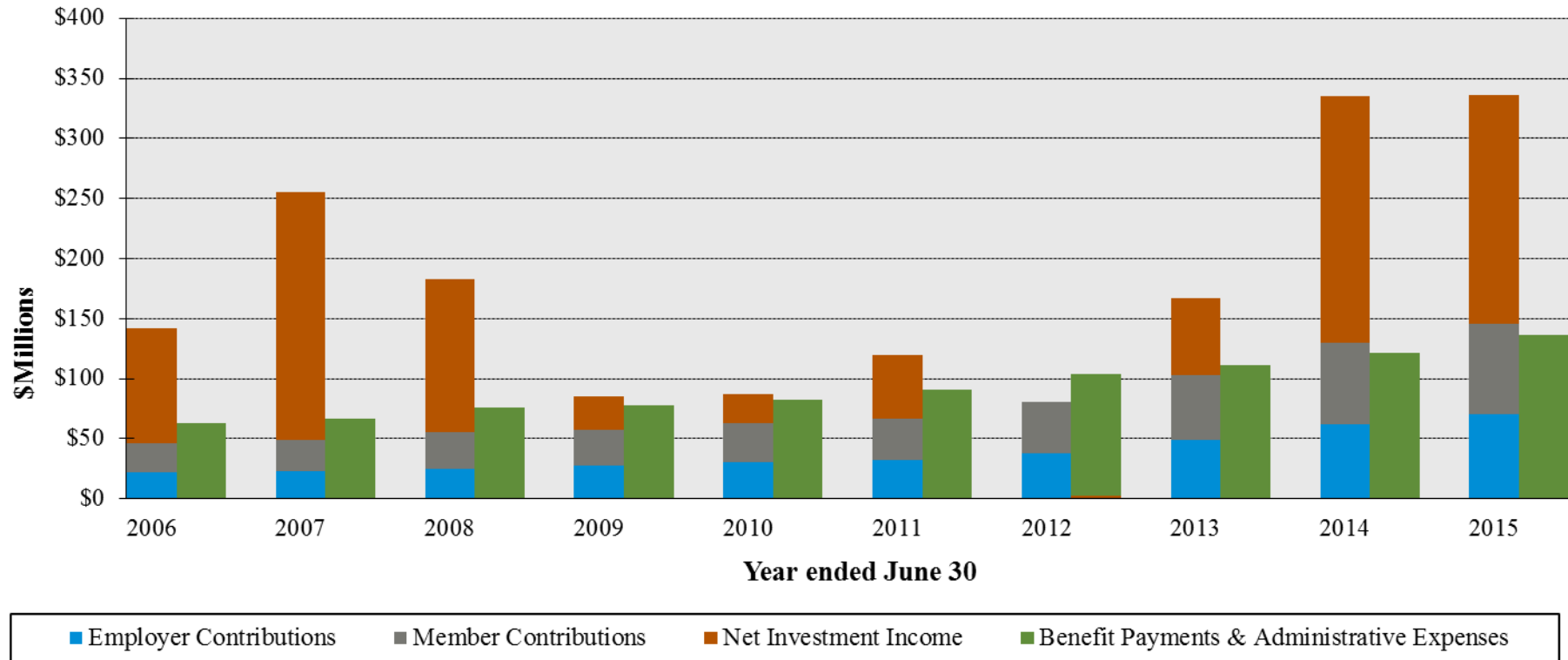
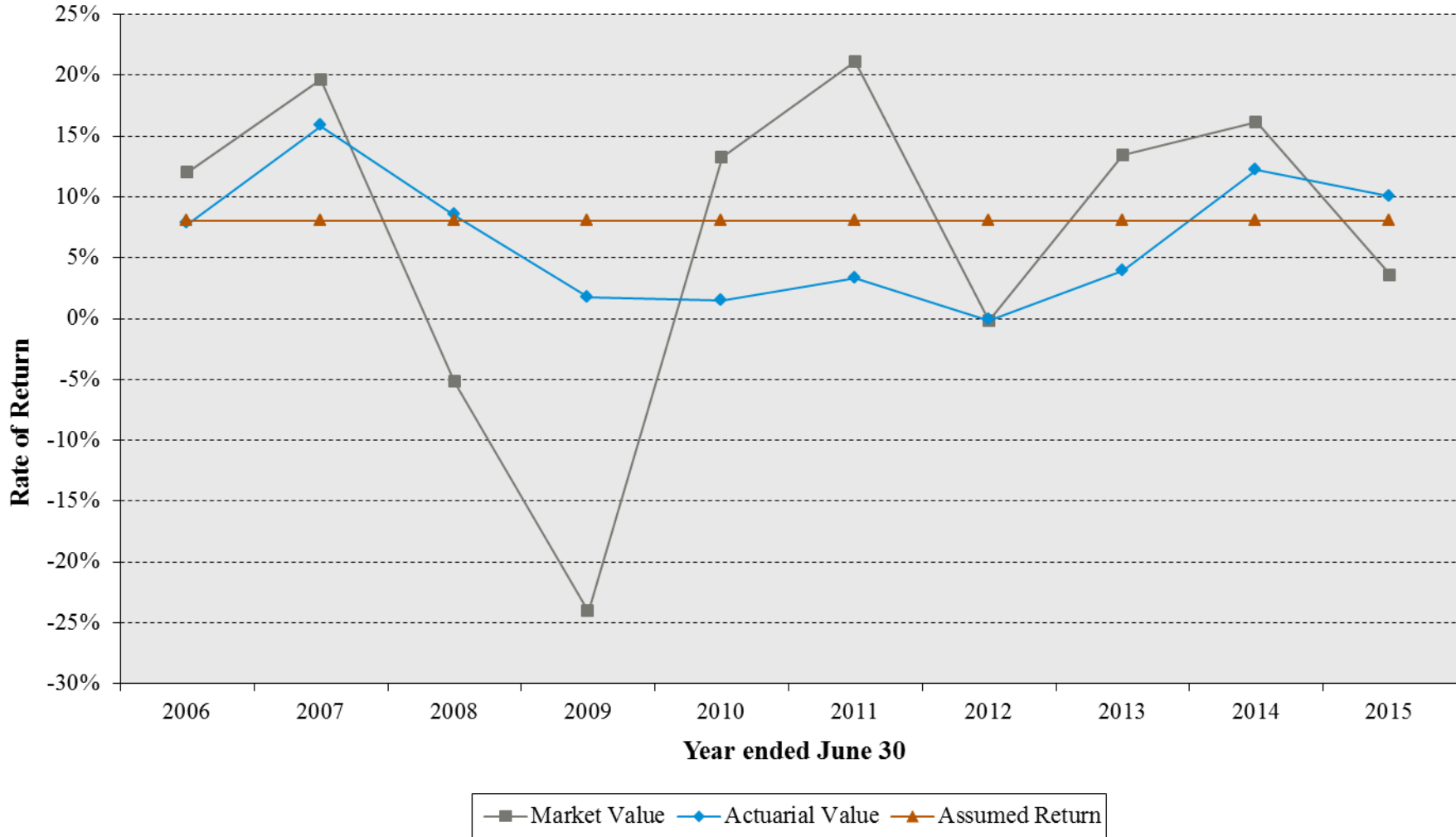


CHART 3

**Market Value and Actuarial Rates of Return
(PERS and HPRS Combined)**



Results of Actuarial Valuation

The contribution requirement consists of the normal cost, administrative expense allowance, plus the cost of amortizing the unfunded actuarial accrued liability over a scheduled period of years. The Board has adopted a policy with regard to the unfunded liability of determining cost using an open amortization schedule of 20 years with increasing payments. The calculated employer contribution requirements on this basis for fiscal year 2015-2016 are shown below as a dollar amount and as a percentage of the covered payroll of contributing employees.

Main System

The components of the actuarial contribution requirements are shown below:

	Amount for 2015 – 2016	Percentage of Payroll
Total normal cost	\$122,308,342	12.31%
Less: Member contributions	<u>(69,552,673)</u>	<u>(7.00)</u>
Net employer normal cost	\$52,755,669	5.31%
Administrative expense allowance	2,400,044	0.24
Amortization payment (credit)	<u>66,202,742</u>	<u>6.66</u>
Total employer contribution requirement	\$121,358,455	12.21%

Covered payroll is \$993,609,618.

The total statutory contribution rate is 14.12% of payroll (7.00% for the member and 7.12% for the employer) as of July 1, 2015, resulting in a deficit of 5.09% of payroll. This and the Board’s funding policy results in an infinite effective amortization period. The contribution net of normal cost and administrative expenses is never projected to exceed interest on the Unfunded Actuarial Accrued Liability, and the Unfunded Actuarial Accrued Liability is not being amortized. If deferred asset appreciation were taken into account on the valuation date, the Unfunded Actuarial Accrued Liability would still not be amortized.

The total employer contribution requirement was 11.06% of payroll last year, resulting in a deficit of 3.94% based on the ultimate statutory contribution rates. Table 7 presents a detailed explanation of the factors that changed the employer contribution requirement from July 1, 2014 to July 1, 2015.

Judges

The components of the actuarial contribution requirement are shown below:

	Amount for 2015 – 2016	Percentage of Payroll
Total normal cost	\$ 1,322,507	18.18%
Less: Member contributions	<u>(581,955)</u>	<u>(8.00)</u>
Net employer normal cost	\$ 740,552	10.18%
Administrative expense allowance	11,559	0.16
Amortization payment (credit)	<u>29,602</u>	<u>0.41</u>
Total employer contribution requirement	\$781,713	10.75%

Covered payroll is \$7,274,441 .

The total statutory contribution rate is 25.52% of payroll (8.00% for the member and 17.52% for the employer) as of July 1, 2015, resulting in a margin of 14.77% of payroll and an effective amortization period of 0.8 years. If deferred asset appreciation were taken into account on the valuation date, the assets would exceed the Actuarial Accrued Liability and no amortization would be required.

The total employer contribution requirement was 14.80% of payroll last year, resulting in a margin of 2.72% based on the statutory contribution rates.

A reconciliation of the change in the cost rate since the previous valuation follows:

	Percentage of Payroll
Employer contribution rate as of July 1, 2014	14.80%
Assumption change	(3.77)
Investment gain and gains due to contributions	(1.15)
Other Plan experience during the year	0.95
Effect of 20-year open amortization schedule	<u>(0.08)</u>
Employer contribution rate as of July 1, 2015	10.75%

Law Enforcement with prior Main System service (includes former National Guard members)

The components of the actuarial contribution requirement are shown below:

	Amount for 2015 – 2016	Percentage of Payroll
Total normal cost	\$2,215,447	11.85%
Less: Member contributions	<u>(1,043,977)</u>	<u>(5.58)</u>
Net employer normal cost	\$1,171,470	6.27%
Administrative expense allowance	29,842	0.16
Amortization payment (credit)	<u>626,884</u>	<u>3.35</u>
Total employer contribution requirement	\$1,828,196	9.78%

Covered payroll is \$18,692,512.

The approved ultimate employer contribution rate is 9.81% of payroll (10.31% for Bureau of Criminal Investigation (BCI)) as of July 1, 2015; the ultimate statutory member contribution rate is 5.50% of payroll (6.00% for BCI). The plan has a margin of 0.10% of payroll. Under the current policy and statute, this segment has an effective amortization period of 19.1 years. If deferred asset appreciation were taken into account on the valuation date, the effective amortization period would be reduced to 10.5 years.

The total employer contribution requirement, including former National Guard members, was 9.42% of payroll last year, resulting in a deficit of 0.27% based on the ultimate statutory contribution rates.

A reconciliation of the change in the cost rate since the previous valuation follows:

	Percentage of Payroll
Employer contribution rate as of July 1, 2014 (including former National Guard members)	9.42%
Employee contribution rate change	(0.04)
Investment gain and gain due to contributions	(0.07)
Assumption change	0.39
Other Plan experience during the year	0.22
Effect of 20-year open amortization schedule	<u>(0.14)</u>
Employer contribution rate as of July 1, 2015	9.78%

Law Enforcement without prior Main System service

The components of the actuarial contribution requirement are shown below:

	Amount for 2015 – 2016	Percentage of Payroll
Total normal cost	\$ 597,633	13.05%
Less: Member contributions	<u>(251,864)</u>	<u>(5.50)</u>
Net employer normal cost	\$345,769	7.55%
Administrative expense allowance	7,402	0.16
Amortization payment (credit)	<u>14,632</u>	<u>0.32</u>
Total employer contribution requirement	\$367,803	8.03%

Covered payroll is \$4,579,348.

The total approved contribution rate is 13.43% of payroll (5.50% for the member and 7.93% for the employer), resulting in a deficit of 0.10% of payroll and an effective amortization period of 37.4 years. If deferred asset appreciation were taken into account on the valuation date, the assets would exceed the Actuarial Accrued Liability and no amortization would be required.

The total employer contribution requirement was 7.42% of payroll last year, resulting in a margin of 0.51% based upon the statutory contribution rates.

A reconciliation of the change in the contribution requirement since the previous valuation follows:

	Percentage of Payroll
Employer contribution rate as of July 1, 2014	7.42%
Assumption change	(0.18)
Investment gain and gain due to contributions	(0.05)
Other plan experience during the year	0.87
Effect of 20-year open amortization schedule	<u>(0.03)</u>
Employer contribution rate as of July 1, 2015	8.03%

Main System, Judges and Law Enforcement Combined

The components of the actuarial contribution requirement are shown below.

	Amount for 2015 – 2016	Percentage of Payroll
Total normal cost	\$126,443,929	12.35%
Less: Member contributions	<u>(71,430,469)</u>	<u>(6.97)</u>
Net employer normal cost	\$55,013,460	5.37%
Administrative expense allowance	2,448,847	0.24
Amortization payment (credit)	<u>66,873,860</u>	<u>6.53</u>
Total employer contribution requirement	\$124,336,167	12.14%

Covered payroll is \$1,024,155,919.

The total employer contribution requirement was 11.04% of payroll last year.

TABLE 7
Main System
Reconciliation of the Change in Employer Contribution Requirement

	Percent of Payroll
Employer Contribution Requirement as of July 1, 2014	11.06%
<i>Retired Life Mortality</i>	
The release of liability due to deaths among retirees and beneficiaries was greater than expected.	
<i>Withdrawals</i>	
The release of liability due to withdrawals prior to retirement was less than expected.	
<i>Contributions</i>	
Actual contributions were less than the employer contribution requirement	
<i>Retirement</i>	
The net change in liability due to non-disability retirements was greater than expected.	
<i>Investments</i>	
The rate of return on the actuarial value of assets was more than assumed.	
<i>Salary Scale and Service</i>	
Salaries increased less than expected.	
<i>Administrative Expenses</i>	
Actual expenses were more than expected.	
<i>Reinstated Members</i>	
The addition reinstated members increased the plan liabilities.	
<i>Change in Size and Composition of Membership</i>	
<i>Employee Contribution Rate Increase</i>	
<i>Assumption Changes</i>	
<i>Effect of 20-year open amortization schedule</i>	
Employer Contribution Requirement as of July 1, 2015	12.21%

Funding Status

The calculation of funded ratios provides one measure of the progress of funding a retirement plan. The funded ratio is the percentage of plan liabilities covered by plan assets. High ratios indicate a well-funded plan with assets sufficient to cover the plan's liabilities. Lower ratios may indicate funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors. This ratio can be calculated using different measures of the retirement plan's liabilities.

Funding Basis - Actuarial Accrued Liability

This measure of liabilities is used in calculating pension costs. It uses the Entry Age Normal Actuarial Cost Method that spreads costs as a level percentage of payroll over a member's working career.

For determining plan costs, a smoothed value of assets (called the actuarial value) is used. Hence, the actuarial value of assets was used to calculate the funded ratios.

Historical Results

The funded ratios for the last ten years are developed in Table 8. These ratios are graphed in Chart 4 on page 29. The funded ratio is 68.6% using actuarial value as of June 30, 2015 and was 64.5% as of June 30, 2014. The funded ratio deteriorated from July 1, 2007 through July 1, 2013, but increased July 1, 2014 and July 1, 2015. This pattern is due to investment losses, statutory contribution rates less than the actuarially determined contribution requirement, and a positive return on actuarial assets in 2013/2014 and 2014/2015.

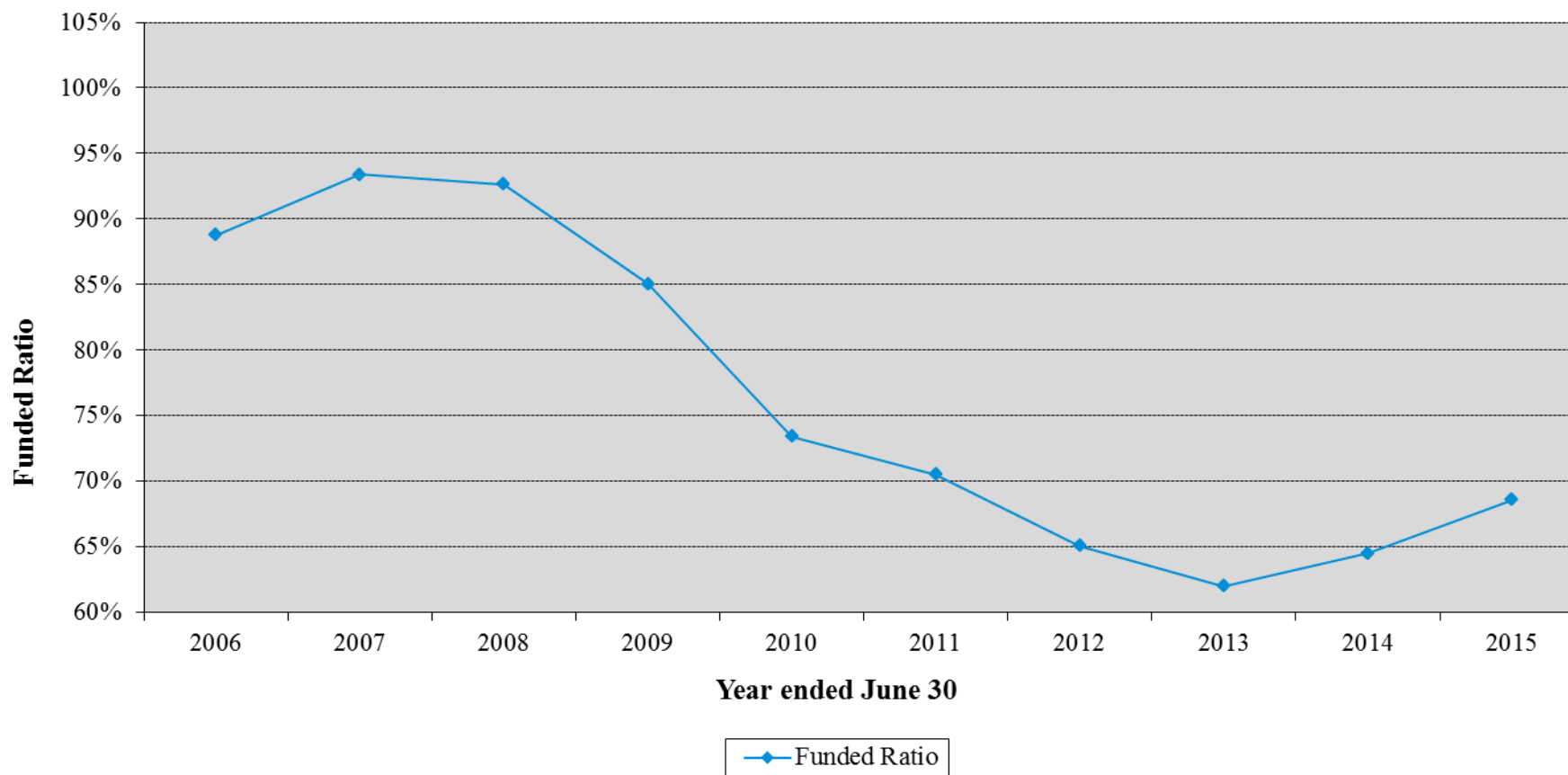
Funded ratios change over time due to several factors. These factors include the level of contributions, actual experience (including investment returns), plan amendments and changes in assumptions. In particular, the actuarial assumptions were changed in 2006, 2010 and 2015, changing the funded ratio from what it would have been otherwise.

TABLE 8**Funded Ratio for PERS**

As of July 1	Actuarial Accrued Liability	Actuarial Value of Assets	Funded Ratio
2006	\$1,480,456,700	\$1,314,542,900	88.8%
2007	1,609,168,600	1,503,137,900	93.4
2008	1,737,627,000	1,609,810,300	92.6
2009	1,901,200,800	1,617,147,800	85.1
2010	2,208,386,100	1,621,723,100	73.4
2011	2,339,833,200	1,650,463,700	70.5
2012	2,501,331,500	1,627,395,600	65.1
2013	2,716,494,800	1,682,958,500	62.0
2014	2,938,752,200	1,895,837,700	64.5
2015	3,052,446,500	2,094,251,400	68.6

CHART 4

Funded Ratio for PERS
(Ratio of Actuarial Value of Assets to Actuarial Accrued Liability)



A. Actuarial Valuation Certificate

October 26, 2015

NORTH DAKOTA PUBLIC EMPLOYEES RETIREMENT SYSTEM

This is to certify that Segal Consulting (“Segal”) has prepared an Actuarial Valuation of the System as of July 1, 2015 in accordance with generally accepted actuarial principles and practices. It has been prepared at the request of the Board to assist in administering the System. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board and may only be provided to other parties in its entirety.

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

The valuation was based on information supplied by the Retirement Office with respect to member and financial data. Segal does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. To the extent we can, however, Segal does review the data for reasonableness and consistency. Based on our review of the data, we have no reason to doubt the substantial accuracy of the information on which we have based this report and we have no reason to believe there are facts or circumstances that would affect the validity of these results.

We are members of the American Academy of Actuaries, and we meet the Qualifications Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Certain assumptions, including interest rates, mortality tables and others identified in the report are prescribed by the Board and in our opinion, are reasonably related to the experience of the Plan and the expectations for the Plan. The Board is also responsible for selecting the actuarially required contribution, actuarial cost method and asset valuation method.

We are available to provide further information or to answer any questions regarding the report.

Brad Ramirez, FSA, MAAA, FCA, EA
Vice President & Consulting Actuary

Tammy F. Dixon, FSA, MAAA, EA
Vice President & Actuary

Laura L. Mitchell, MAAA, EA
Vice President & Consulting Actuary

EXHIBIT I-A
ACTUARIAL VALUATION RESULTS
MAIN SYSTEM

1.	Actuarial accrued liability on July 1, 2015:		
	a. Active members	\$1,578,843,212	
	b. Special prior service pensions	1,074	
	c. Retired members and beneficiaries.....	1,227,994,794	
	d. Inactive non-retired members.....	<u>169,232,728</u>	
	e. Total.....		\$2,976,071,808
2.	Assets at actuarial value (\$2,296,088,880 at market value)		2,027,476,214
3.	Unfunded/(Surplus) actuarial accrued liability - equals (1) minus (2)		948,595,594
4.	Member and employer normal cost for ensuing year ¹		122,308,342
5.	Estimated annual salaries of covered members		993,609,618
6.	Member normal cost - equals 7.00% of (5)		69,552,673
7.	Employer normal cost for ensuing year - equals (4) minus (6)		52,755,669
8.	Amortization payment - equals 20-year amortization of item (3) as a level percent of aggregate salary ¹		66,202,742
9.	Administrative expenses		2,400,044
10.	Total employer cost for ensuing year - equals (7) plus (8) plus (9).....		121,358,455
11.	Total employer cost as percentage of payroll – equals (10) divided by (5).....		12.21%

¹ Adjusted for interest to recognize payments throughout the year.

EXHIBIT I-B
ACTUARIAL VALUATION RESULTS
JUDGES

1.	Actuarial accrued liability on July 1, 2015:		
	a. Active members	\$18,136,988	
	b. Retired members and beneficiaries.....	20,416,692	
	c. Inactive non-retired members	<u>827,763</u>	
	d. Total.....		\$39,381,443
2.	Assets at actuarial value (\$44,137,412 at market value)		38,973,906
3.	Unfunded/(Surplus) actuarial accrued liability - equals (1) minus (2)		407,537
4.	Member and employer normal cost for ensuing year ¹		1,322,507
5.	Estimated annual salaries of covered members		7,274,441
6.	Member normal cost - equals 8.00% of (5)		581,955
7.	Employer normal cost for ensuing year - equals (4) minus (6)		740,552
8.	Amortization payment - equals 20-year amortization of item (3) as a level percent of aggregate salary ¹		29,602
9.	Administrative expenses		11,559
10.	Total employer cost for ensuing year - equals (7) plus (8) plus (9).....		781,713
11.	Total employer cost as percentage of payroll – equals (10) divided by (5).....		10.75%

¹ Adjusted for interest to recognize payments throughout the year.

EXHIBIT I-C

ACTUARIAL VALUATION RESULTS

LAW ENFORCEMENT WITH PRIOR MAIN SYSTEM SERVICE

1.	Actuarial accrued liability on July 1, 2015:		
a.	Active members	\$16,340,513	
b.	Retired members and beneficiaries.....	14,917,164	
c.	Inactive non-retired members	<u>3,060,105</u>	
d.	Total.....		\$34,317,782
2.	Assets at actuarial value (\$28,691,976 at market value)		25,335,386
3.	Unfunded/(Surplus) actuarial accrued liability - equals (1) minus (2)		8,982,390
4.	Member and employer normal cost for ensuing year ¹		2,215,447
5.	Estimated annual salaries of covered members		18,692,512
6.	Member normal cost - equals 5.58% ² of (5)		1,043,977
7.	Employer normal cost for ensuing year - equals (4) minus (6)		1,171,470
8.	Amortization payment - equals 20-year amortization of item (3) as a level percent of aggregate salary ¹		626,884
9.	Administrative expenses		29,842
10.	Total employer cost for ensuing year - equals (7) plus (8) plus (9).....		1,828,196
11.	Total employer cost as percentage of payroll – equals (10) divided by (5).....		9.78%

¹ Adjusted for interest to recognize payments throughout the year.

² Adjusted for Bureau of Criminal Investigation and former National Guard rates.

EXHIBIT I-D

ACTUARIAL VALUATION RESULTS

LAW ENFORCEMENT WITHOUT PRIOR MAIN SYSTEM SERVICE

1.	Actuarial accrued liability on July 1, 2015:		
a.	Active members	\$2,101,785	
b.	Retired members and beneficiaries.....	89,735	
c.	Inactive non-retired members	<u>483,986</u>	
d.	Total.....		\$2,675,506
2.	Assets at actuarial value (\$2,792,541 at market value)		2,465,850
3.	Unfunded/(Surplus) actuarial accrued liability - equals (1) minus (2)		209,656
4.	Member and employer normal cost for ensuing year ¹		597,633
5.	Estimated annual salaries of covered members		4,579,348
6.	Member normal cost - equals 5.50% of (5)		251,864
7.	Employer normal cost for ensuing year - equals (4) minus (6)		345,769
8.	Amortization payment - equals 20-year amortization of item (3) as a level percent of aggregate salary ¹		14,632
9.	Administrative expenses		7,402
10.	Total employer cost for ensuing year - equals (7) plus (8) plus (9).....		367,803
11.	Total employer cost as percentage of payroll – equals (10) divided by (5).....		8.03%

¹ Adjusted for interest to recognize payments throughout the year.

EXHIBIT I-E

ACTUARIAL VALUATION RESULTS

**MAIN SYSTEM, JUDGES, NATIONAL GUARD AND
LAW ENFORCEMENT PLAN COMBINED**

1.	Actuarial accrued liability on July 1, 2015:		
	a.	Active members	\$1,615,422,498
	b.	Special prior service pensions	1,074
	c.	Retired members and beneficiaries.....	1,263,418,385
	d.	Inactive non-retired members	<u>173,604,582</u>
	e.	Total.....	\$3,052,446,539
2.	Assets at actuarial value (\$2,371,710,809 at market value)		2,094,251,356
3.	Unfunded/(Surplus) actuarial accrued liability - equals (1) minus (2)		959,184,203
4.	Member and employer normal cost for ensuing year ¹		126,443,929
5.	Estimated annual salaries of covered members		1,024,155,919
6.	Member normal cost		71,430,469
7.	Employer normal cost for ensuing year - equals (4) minus (6)		55,013,460
8.	Amortization payment - equals 20-year amortization of item (3) as a level percent of aggregate salary ¹		66,873,860
9.	Administrative expenses		2,448,847
10.	Total employer cost for ensuing year - equals (7) plus (8) plus (9).....		124,336,167
11.	Total employer cost as percentage of payroll – equals (10) divided by (5).....		12.14%

¹ Adjusted for interest to recognize payments throughout the year.

EXHIBIT II

ACTUARIAL ASSUMPTIONS AND COST METHODS

The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Experience Review: July 2009 – June 2014 completed in May 2015. Current data is reviewed in conjunction with each annual valuation.

1. Mortality Tables:

Healthy: RP-2000 Combined Healthy Mortality Table, set back 2 years for males and 3 years for females, projected generationally using SSA 2014 Intermediate Cost scale from 2014.

Disabled: RP-2000 Disabled Retiree Mortality Table, set back one year for males (no setback for females) multiplied by 125%.

The underlying tables with generational projection to the ages of participants as of the measurement date reasonably reflect the mortality experience of the Plan as of the measurement date.

Sample healthy rates are as follows:

Age	Male	Female
20	0.03	0.02
25	0.04	0.02
30	0.04	0.02
35	0.06	0.04
40	0.10	0.06
45	0.13	0.09
50	0.19	0.13
55	0.29	0.20
60	0.53	0.35

2. Disability Incidence Rates:

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.

Sample rates are as follows:

Age	Male	Female
20	0.01	0.01
25	0.02	0.01
30	0.02	0.01
35	0.03	0.01
40	0.04	0.02
45	0.07	0.04
50	0.12	0.06
55	0.20	0.10
60	0.33	0.16

EXHIBIT II (continued)

3. Withdrawal Rates:

First five years of service:

Main System:

Age	Years of Service				
	0	1	2	3	4
29 & Under	22%	18%	16%	14%	14%
30 - 39	16	14	12	12	11
40 & Over	12	10	10	8	7

Law Enforcement:

Age	Years of Service				
	0	1	2	3	4
29 & Under	25%	23%	20%	17%	15%
30 - 39	20	17	15	13	11
40 & Over	17	15	12	10	7

Ultimate withdrawal rates for five or more years of service:

Main System and Law Enforcement:

Age	Rate
20 - 24	8.8%
25 - 29	8.8
30 - 34	5.5
35 - 39	4.7
40 - 44	3.9
45 - 49	3.7
50 - 54	3.4
55 - 59	0.1
60 & Over	0.2

There are no withdrawal rates for Judges.

EXHIBIT II (continued)

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.

Judges:

Earlier of (i) age 55 and 5 years of service, and (ii) eligibility for Rule of 85.

Law Enforcement:

Age 50 and 3 years of service.

4. Refund of Employee Contributions:

Inactive vested members are assumed to elect a refund of employee contributions in lieu of deferred pension benefits when it is more valuable than the deferred annuity.

5. Retirement Rates for Active and Inactive Vested Members:

Main System:

Age	Early Retirement	Unreduced Retirements
50		30%
51-54		10
55	1%	10
56-59	1	8
60	2	8
61	5	15
62-63	10	30
64	10	20
65		30
66		20
67-74		15
75		100

EXHIBIT II (continued)

Judges:

Age	Rate
55-64	10%
65-74	20
75	100

Law Enforcement:

Age	Rate
50-54	25%
55-61	10
62-65	50
66-74	20
75	100

6. **Interest Rate:**

8.00% per annum, net of investment expenses.

7. **Administrative Expenses:**

Prior year expenses, adjusted for inflation. Assumed expenses for 2015/2016 are as follows:

System	Administrative Expense
<i>Main System</i>	\$2,400,044
<i>Judges</i>	11,559
<i>Law Enforcement with Prior Main Service</i>	29,842
<i>Law Enforcement without Prior Main Service</i>	7,402

8. **Salary Scale:**

Main System:

Less than three years of service:

Service	Percentage Increase	
	State Employees	Non-State Employees
0	12.00%	15.00%
1	9.50	10.00
2	7.25	8.00

EXHIBIT II (continued)

Three or more years of service:

Age	Percentage Increase	
	State Employees	Non-State Employees
Less than 30	7.25%	10.00%
30-39	6.50	7.50
40-49	6.25	6.75
50-59	5.75	6.50
60 & over	5.00	5.25

Law Enforcement:

Less than five years of service:

Service	Percentage Increase
0-2	20.00%
3-4	10.00%

Five or more years of service:

Age	Percentage Increase
Less than 30	7.25%
30-39	6.50
40-49	6.25
50-59	5.75
60 & over	5.00

Judges:

4.00% per annum for all years of service.

9. **Payroll Growth:**

Main System and Law Enforcement:

4.50% per annum

Judges:

4.00% per annum

10. **Inflation:**

3.5% per annum.

EXHIBIT II (continued)

11. Percent Married and Age of Spouse:

Main System and Law Enforcement:

At retirement or death, 75% of members are assumed to have spouses. Males are assumed to be three years older than females.

Judges:

At retirement or death, 100% of members are assumed to have spouses. Males are assumed to be three years older than females.

All spouses are assumed to be the opposite gender as the participant. The relatively low rate of same-gender spouses is not actuarially significant.

12. Part-Time Employees:

One full year of service is credited for each future year of service.

13. Split Service:

Liabilities are held in both plans based on service in each plan and are based on the actuarial assumptions of the plan in which they are currently active.

14. Actuarial Cost Method:

Entry Age Actuarial Cost Method. Entry Age is the age at the time the participant commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary. The unfunded actuarial accrued liability is amortized in installments assuming a 4.50% payroll growth assumption (4.0% for Judges) and an open 20-year period.

15. Actuarial Value of Assets:

Adjusted market value that immediately recognizes interest and dividends. The procedure recognizes 20% of each year's total appreciation (depreciation) beginning with the year of occurrence. After five years, the appreciation (depreciation) is fully recognized. A characteristic of this asset valuation method is that, over time, it is more likely than not to produce an actuarial value of assets that is less than the market value of assets, if the investment return attributable to net interest and dividends is less than the assumed rate of return.

16. 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

EXHIBIT II (continued)

17. Workers' Compensation (for Judges' disability benefit offset):

None assumed.

18. 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.

19. Benefit Election:

Main System and Law Enforcement:

50% of new retirements are assumed to elect the life annuity, 45% are assumed to elect the 50% joint and survivor annuity, and 5% are assumed to elect a Refund of Member Contributions.

Judges:

All participants elect the 50% joint and survivor annuity.

EXHIBIT III

CHANGES IN ACTUARIAL ASSUMPTIONS AND COST METHODS

Based on the results of the Actuarial Experience Study completed in May, 2015, the Board approved several changes to the following actuarial assumptions. Previously, these assumptions were as follows:

1. Mortality Tables:

Healthy: The RP-2000 Combined Healthy Mortality Table, set back three years.

Disabled: The RP-2000 Disabled Retiree Mortality Table, set back one year for males (not set back for females).

2. Disability Incidence Rates:

Before age 65: Males 33% of OASDI disability incidence rates.
Females 20% of OASDI disability incidence rates.

Age 65 and later: 0.25% per year.

EXHIBIT III (continued)

5. Retirement Rates for Active Members:

Main System:

<u>Age</u>	<u>Early Retirement</u>	<u>Unreduced Retirements</u>
51-54		8%
55	2%	8
56-59	2	10
60	4	10
61	10	20
62	20	35
63	15	25
64	10	30
65		30
66-74		20
75		100

Judges:

<u>Age</u>	<u>Rate</u>
60-61	10%
62-64	20
65-69	50
70	100

National Guard and Law Enforcement:

<u>Age</u>	<u>Rate</u>
55-63	20%
64	50
65	100

EXHIBIT III (continued)

Retirement Age for Inactive Vested Members:

Main System and Judges:

The earlier of:

- Age 64.
- Unreduced retirement date for each individual.

National Guard:

Age 55.

Law Enforcement:

The earlier of:

- Age 55.
- Unreduced retirement date for each individual.

7. Administrative Expenses:

<i>Main System:</i>	\$1,100,000
<i>Judges:</i>	\$7,500
<i>Law Enforcement with Prior Main Service (includes National Guard):</i>	\$5,500
<i>Law Enforcement without Prior Main Service:</i>	\$7,500

8. Salary Scale:

Main System, National Guard and Law Enforcement:

Less than five years of service:

<u>Service</u>	<u>Percentage Increase</u>
0	8.25%
1	7.25
2	6.75
3	6.50
4	6.25

EXHIBIT III (continued)

Five or more years of service (sample rates are as follows):

<u>Age</u>	<u>Percentage Increase</u>	<u>Age</u>	<u>Percentage Increase</u>
25	6.25%	45	5.11%
30	5.93	50	5.02
35	5.50	55	4.93
40	5.23	60	4.86

Judges:

5.00% per annum for all years of service.

11. Percent Married and Age of Spouse:

Main System, National Guard, and Law Enforcement:

At retirement or death, 80% of male members and 65% of female members are assumed to have spouses. Males are assumed to be three years older than their female spouses.

Judges:

At retirement or death, 100% of members are assumed to have spouses. Males are assumed to be three years older than their female spouses.

14. Actuarial Cost Method:

Entry Age Actuarial Cost Method. Entry Age is the age at the time the participant commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary. The unfunded actuarial accrued liability is amortized in installments assuming a 4.50% payroll growth assumption and an open 20-year period.

19. Benefit Election:

100% of the married participants elect the 50% joint and survivor annuity and 100% of the unmarried participants elect the life annuity.

EXHIBIT IV

SUMMARY OF PLAN PROVISIONS

This exhibit summarizes the major benefit provisions of the North Dakota Public Employees Retirement System as included in the 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.

EXHIBIT IV (continued)

Law Enforcement:

Attainment of age 50 with three years of service.

➤ 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.

EXHIBIT IV (continued)

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.

EXHIBIT IV (continued)

➤ Benefit:

Main System and Law Enforcement:

One of the following options:

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

EXHIBIT IV (continued)

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

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.

EXHIBIT IV (continued)

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 follow:

	Rates Set by Statute		Rates Determined by the Board of Retirement
	<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%		10.31%
> National Guard members ¹	4.50%		7.00%
Law Enforcement without prior Main System service	5.50%		7.93%

¹ Effective August 1, 2015, the member contribution rate for former National Guard members increased to 6% and the employer contribution rate increased to 9.81%. Effective January 1, 2016, the contribution rate for National Guard members of the State Law Enforcement plan will be reduced by 0.5% to 5.50%.

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.

EXHIBIT V

CHANGES IN PLAN PROVISIONS

As a result of legislation passed in May 2015, the following plan provisions were changed:

1. The Normal Service Pension 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).
2. Benefits for Early Retirement 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.
3. Effective August 1, 2015, National Guard merged into Law Enforcement with Prior Main System service. As a result, the member contribution rate for former National Guard members increased to 6% and the employer contribution rate increased to 9.81%. Effective January 1, 2016, the contribution rate for former National Guard members of the State Law Enforcement plan will be reduced by 0.5% to 5.50%.

B. Census Tables

	<u>Table Designation</u>
I. Active Members	
(A) Number of active members grouped by nearest age and years of employment	9
(B) Number of active members grouped by nearest age and salary	10
II. Current Plan Pensions	
(A) Distribution of pensions awarded during the year by amount of benefit and type of pension.....	11
(B) Distribution of pensions awarded during the year by nearest age and type of pension	12
(C) Distribution of pensions in force by amount of benefit and type of pension.....	13
(D) Distribution of pensions in force by nearest age and type of pension	14
III. Special Prior Service Pensions	
(A) Distribution of pensions in force by amount of benefit	15
(B) Distribution of pensions in force by nearest age.....	16

TABLE 9

***Census of Members in Active Service on July 1, 2015
by Nearest Age and Years of Employment in PERS***

(All Members – Main System, Judges, and Law Enforcement)

Nearest Age	Total	Years of Employment							
		Under 5	5 - 9	10 - 14	15 - 19	20 - 24	25 – 29	30 - 34	35 & Over
Total	22,845	9,871	4,681	2,705	2,105	1,354	965	670	494
Under 20	21	21	-	-	-	-	-	-	-
20 – 24	693	692	1	-	-	-	-	-	-
25 – 29	1,912	1,717	194	1	-	-	-	-	-
30 – 34	2,284	1,542	651	91	-	-	-	-	-
35 – 39	2,483	1,346	643	392	102	-	-	-	-
40 – 44	2,452	1,081	617	357	337	59	1	-	-
45 – 49	2,640	996	637	351	290	256	105	5	-
50 – 54	3,270	979	616	502	402	321	268	171	11
55 – 59	3,516	852	651	476	471	330	299	274	163
60 – 64	2,585	456	465	367	362	296	232	169	238
65 – 69	744	140	148	116	115	77	50	38	60
70 – 74	173	38	40	34	16	11	9	7	18
75 & over	72	11	18	18	10	4	1	6	4

TABLE 10

*Census of Members in Active Service on July 1, 2015
by Nearest Age and Salary*

(All Members – Main System, Judges, and Law Enforcement)

Nearest Age	Total	Annualized Salary									
		Less than \$10,000	\$10,000 - \$14,999	\$15,000 - \$19,999	\$20,000 - \$24,999	\$25,000 - \$29,999	\$30,000 - \$34,999	\$35,000 - \$39,999	\$40,000 - \$44,999	\$45,000 - \$49,999	\$50,000 & Over
Total	22,845	1,016	906	1,548	1,575	1,713	2,337	2,489	2,394	2,220	6,647
Under 20	21	7	2	1	2	4	3	1	1	0	0
20 – 24	693	114	55	72	59	75	112	80	62	32	32
25 – 29	1,910	162	84	135	118	145	251	247	249	198	323
30 – 34	2,283	133	78	132	115	185	243	239	282	276	601
35 – 39	2,483	125	126	150	139	155	210	254	245	296	783
40 – 44	2,452	103	104	181	153	144	228	251	276	239	773
45 – 49	2,640	106	88	198	196	194	244	272	253	246	843
50 – 54	3,270	85	87	205	238	231	315	394	360	307	1,048
55 – 59	3,515	82	97	205	277	300	361	372	344	326	1,152
60 – 64	2,584	54	98	174	193	187	274	271	248	230	856
65 – 69	744	28	49	52	58	77	79	84	59	57	201
70 – 74	173	11	23	22	20	11	10	22	12	10	32
75 & over	72	6	15	21	7	5	7	2	3	3	3

TABLE 11***Pensions Awarded During the Year Ended June 30, 2015
by Type of Pension and Monthly Amount******(All Members – Main System, Judges, and Law Enforcement)***

Monthly Amount	Total	Type of Pension			
		Normal	Early	Rule of 85	Disability
Total	980	386	168	398	28
Under \$200	73	41	26	6	-
200 - 399	107	59	40	3	5
400 - 599	101	45	44	4	8
600 - 799	73	46	17	3	7
800 - 999	56	30	11	8	7
1,000 - 1,199	50	22	11	17	-
1,200 - 1,399	53	23	8	21	1
1,400 - 1,599	53	20	5	28	-
1,600 - 1,799	37	11	2	24	-
1,800 - 1,999	51	16	1	34	-
2,000 - 2,199	38	10	-	28	-
2,200 - 2,399	43	10	2	31	-
2,400 - 2,599	28	6	1	21	-
2,600 - 2,799	39	11	-	28	-
2,800 - 2,999	19	3	-	16	-
3,000 - 3,199	22	4	-	18	-
3,200 - 3,399	16	1	-	15	-
3,400 - 3,599	15	3	-	12	-
3,600 - 3,799	14	2	-	12	-
3,800 - 3,999	16	4	-	12	-
4,000 - 4,199	15	-	-	15	-
4,200 - 4,399	14	3	-	11	-
4,400 - 4,599	7	3	-	4	-
4,600 - 4,799	6	4	-	2	-
4,800 - 4,999	8	3	-	5	-
5,000 & over	26	6	-	20	-

TABLE 12

*Pensions Awarded During the Year Ended June 30, 2015
by Type of Pension and Nearest Age*

(All Members – Main System, Judges, and Law Enforcement)

Nearest Age	Total	Type of Pension			
		Normal	Early	Rule of 85	Disability
Total	980	386	168	398	28
Under 50	1	-	-	-	1
50 - 54	29	-	1	24	4
55 - 59	125	2	19	101	3
60 - 64	361	4	123	225	9
65 - 69	376	292	25	48	11
70 - 74	63	63	-	-	-
75 & over	25	25	-	-	-

TABLE 13***Current Plan Pensioners in Force as of July 1, 2015
by Type of Pension and Monthly Amount******(All Members – Main System, Judges, and Law Enforcement)***

Monthly Amount	Total	Type of Pension			
		Normal	Early	Service ¹	Disability
Total	9,193	2,985	2,448	3,422	338
Under \$200	1,100	518	541	27	14
200 - 399	1,504	566	793	44	101
400 - 599	1,152	436	543	64	109
600 - 799	778	315	265	129	69
800 - 999	677	258	113	274	32
1,000 - 1,199	624	186	91	342	5
1,200 - 1,399	570	152	41	372	5
1,400 - 1,599	450	118	22	309	1
1,600 - 1,799	379	79	11	289	-
1,800 - 1,999	342	72	9	260	1
2,000 - 2,199	276	54	4	217	1
2,200 - 2,399	265	42	6	217	-
2,400 - 2,599	207	33	1	173	-
2,600 - 2,799	173	28	1	144	-
2,800 - 2,999	117	19	1	97	-
3,000 - 3,199	102	16	2	84	-
3,200 - 3,399	82	8	-	74	-
3,400 - 3,599	61	9	2	50	-
3,600 - 3,799	44	7	-	37	-
3,800 - 3,999	55	13	1	41	-
4,000 - 4,199	49	8	1	40	-
4,200 - 4,399	39	6	-	33	-
4,400 - 4,599	29	9	-	20	-
4,600 - 4,799	24	9	-	15	-
4,800 - 4,999	19	7	-	12	-
5,000 & over	75	17	-	58	-

¹ Includes Rule of 85, Rule of 88 and Rule of 90

TABLE 14***Current Plan Pensioners in Force as of July 1, 2015
by Type of Pension and Nearest Age******(All Members – Main System, Judges, and Law Enforcement)***

Nearest Age	Total	Type of Pension			
		Normal	Early	Service ¹	Disability
Total	9,193	2,985	2,448	3,422	338
Under 50	18	0	0	0	18
50 - 54	59	0	1	36	22
55 - 59	363	6	49	262	46
60 - 64	1,230	18	371	771	70
65 - 69	2,543	776	673	1,028	66
70 - 74	1,853	795	447	566	45
75 - 79	1,375	568	376	392	39
80 - 84	913	374	288	230	21
85 - 89	525	268	167	85	5
90 & over	314	180	76	52	6

¹ Includes Rule of 85, Rule of 88 and Rule of 90

TABLE 15

*Special Prior Service Pensions in Force on July 1, 2015
by Monthly Amount*

Monthly Amount	Total
Total	3
Under \$20	3

TABLE 16

*Special Prior Service Pensions in Force on July 1, 2015
by Nearest Age*

Nearest Age	Total
Total	3
95 – 99	2
100 & Over	1

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