NORTH DAKOTA HIGHWAY PATROLMEN'S RETIREMENT SYSTEM

ACTUARIAL VALUATION AND REVIEW AS OF JULY 1, 2014

THE SEGAL GROUP
Founded in 1939

Segal Consulting

Segal Consulting

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

November 14, 2014

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, 2014 for the North Dakota Highway Patrolmen's Retirement System. It summarizes the actuarial data used in the valuation, establishes the actuarially determined contribution requirements for the 2014-2015 plan year, and analyzes the preceding year's experience.

The census and financial information on which our calculations are based were 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

5337383v1/01640.001

Table of Contents

Introduction

This report has been prepared by Segal Consulting to present a valuation of the North Dakota Highway Patrolmen's Retirement System as of July 1, 2014. The valuation was performed to determine whether the assets and statutory contributions are anticipated to be sufficient to provide the prescribed benefits. The employer contribution requirements presented in this report are based on:

1. The present provisions of the North Dakota Highway Patrolmen's Retirement System;

2. The characteristics of covered active members, inactive non-retired members, pensioners and beneficiaries as of July 1, 2014;

3. The assets of the System as of June 30, 2014; 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 Highway Patrolmen's Retirement System in accordance with its benefit provisions. 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

- The present rate of contributions is not sufficient to meet the actuarially determined requirement for 2014-2015, based upon the actuarial assumptions and financing objectives approved by the Board. However, if the unrecognized asset appreciation were recognized immediately, the ultimate statutory contribution rate is projected to be sufficient.

- The employer actuarial contribution requirement for 2014-2015 is $2,201,479, or 21.70% of payroll, and exceeds the statutory rate of 19.70% of payroll as of the valuation date by 2.00%. Last year, the actuarial contribution requirement was 25.11% and exceeded the ultimate statutory rate of 19.70% by 4.91%.

- The decrease in the contribution rate deficit this year was primarily due to the asset return.

- The return on the market value of assets for 2013-2014 was 16.29%, and was 13.52% for the previous year.

- The return on the actuarial value of assets for 2013-2014 was 12.60% compared to the investment return assumption of 8.00%. As a result, the System experienced an actuarial investment gain of $2.2 million.

- A comparison of this year's funded ratio to the prior year is as follows:

	July 1, 2014	July 1, 2013
Actuarial Value of Assets	$54,563,383	$49,039,331
Actuarial Accrued Liability	75,464,668	71,892,312
Funded Ratio	72.3%	68.2%

- The ratio of the actuarial value of assets to the market value of assets was 83.1%. Last year, this ratio was 86.0%. The unrecognized asset appreciation represents about 16.9% of the market value of assets. A property of the asset smoothing method used by North Dakota Public Employees Retirement System (PERS) is that the actuarial value of assets will tend to lag behind the market value of assets. This unrecognized appreciation will be recognized over the next five years. The potential impact may be illustrated as follows:

  - If the unrecognized appreciation were recognized immediately in the actuarial value of assets, the funded percentage would increase from 72.3% to 87.0%.

  - If the unrecognized appreciation were recognized immediately in the actuarial value of assets, the actuarial contribution requirement would decrease from 21.70% of payroll to 14.06% of payroll.

- The actuarial valuation report as of July 1, 2014 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.

- The Governmental Accounting Standards Boards (GASB) recently approved two new Statements. Statement 67 replaces Statement 25 and governs plan reporting. Statement 68 replaces Statement 27 and governs employer reporting. It is important to note that the new GASB rules only redefine liabilities and pension expense for financial reporting purposes, and do not apply to contribution amounts for funding purposes. These statements are applicable for preparing the 2013/2014 fiscal year financial statements for the Plan and for the 2014/2015 fiscal year financial statements for contributing employers. The employer has elected to continue use of Statement 27 for the employer reporting for the 2014/2015 fiscal year. The information required by GASB Statement 67 will be provided in a separate report.

Member Characteristics

Last year, as of July 1, 2013, there were 149 covered active members, 9 terminated members eligible for a deferred vested benefit, and 6 terminated member eligible for a refund of their accumulated contributions. During the year, 6 members terminated employment and 1 member retired. There were 11 new members, 1 data adjustment, 4 members transferred from the PERS System, and 2 members transferred to the PERS System in fiscal year 2013-2014. Therefore, there were 156 active Highway Patrolmen covered under the provisions of the System as of July 1, 2014. The significant age, service, salary and accumulated contribution information for these members is summarized below along with comparative figures from the preceding actuarial valuation.

	As of July 1, 2014	As of July 1, 2013
Data for active members:		
Eligible for immediate retirement benefits	15	15
Vested (not eligible for immediate retirement)	60	56
Non-vested	81	78
Total*	156	149
Average age	37.3	37.3
Average years of service (excluding service before transfer)	11.2	10.8
Average annual salary	$61,503	$59,322
Average accumulated contributions	94,916	90,908

* Excludes 13 members this year and 10 members last year with split service in the Highway Patrolmen's System and the PERS System, and currently funded in the PERS System.

For the 140 members continuing in active service from last year, average salaries increased by 8.1%. The average service for all actives increased by 0.4 years since last year. Distributions of active employees by age, service (excluding service before transfer), and salary are presented in Tables 1 and 2.

13 members from the Highway Patrol continue to be members in PERS; 13 members from PERS are active members in the Highway Patrol. Liabilities for these members are carried in both systems based on their service in that system.

11 terminated members are eligible for a deferred vested benefit and 8 terminated members have elected immediate payment of contribution refunds.

TABLE 1

Census of Members in Active Service on July 1, 2014
by Nearest Age and Years of Employment

		Years of Employment						
Nearest Age	Total	Under 5	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 & Over
Total	156	48	37	25	21	11	13	1
20 – 24	8	8	-	-	-	-	-	-
25 – 29	26	23	3	-	-	-	-	-
30 - 34	33	11	16	6	-	-	-	-
35 - 39	29	3	9	14	3	-	-	-
40 - 44	27	3	6	5	13	-	-	-
45 - 49	15	-	1	-	2	10	2	-
50 - 54	15	-	2	-	3	1	9	-
55 & over	3	-	-	-	-	-	2	1

TABLE 2

Census of Members in Active Service on July 1, 2014
by Nearest Age and Actual Salary

		Actual Salary						
Nearest Age	Total	Under $30,000	$30,000-$39,999	$40,000-$49,999	$50,000-$59,999	$60,000-$69,999	$70,000-$79,999	$80,000 & over
Total	156	15	1	1	59	51	17	12
20 - 24	8	7	-	-	1	-	-	-
25 - 29	26	3	-	1	22	-	-	-
30 - 34	33	4	1	-	18	8	2	-
35 - 39	29	1	-	-	8	14	3	3
40 - 44	27	-	-	-	8	11	6	2
45 - 49	15	-	-	-	1	9	2	3
50 - 54	15	-	-	-	1	7	3	4
55 & over	3	-	-	-	-	2	1	-

Benefit Experience

There were 86 pensioners (including 4 disabled pensioners), 4 former spouses and 26 surviving spouses receiving benefits as of July 1, 2013. During the year ended June 30, 2014, 1 member was awarded a retirement pension, and 2 retirees died leaving surviving spouses. Therefore, there were 85 pensioners (including 4 disabled pensioners), 3 former spouses and 29 surviving spouses receiving benefits as of July 1, 2014. Key statistics on pensioners and beneficiaries are shown below.

	July 1, 2014	July 1, 2013
Number of pensioners and beneficiaries (including former spouses)	117	116
Annualized benefits in force	$3,823,785	$3,749,654
Average monthly benefit	$2,723	$2,694
Average age	68.5	67.7

Tables 3 and 4 summarize the census data for pensioners and beneficiaries. In the year ended June 30, 2014, benefit payments totaled $3,784,735, including contribution refund payments of $32,108. In the year ended June 30, 2013, benefit payments totaled $3,772,316.

TABLE 3

Pensions in Force on July 1, 2014
by Type of Recipient and Monthly Amount

Monthly Amount	Total	Pensioner	Beneficiary	Alternate Payee	Disabled
Total	117	81	29	3	4
Under $499	7	-	6	1	-
500 - 999	6	-	5	1	-
1,000 - 1,499	17	2	13	1	1
1,500 - 1,999	4	2	2	-	-
2,000 - 2,499	18	14	2	-	2
2,500 - 2,999	17	15	1	-	1
3,000 - 3,499	17	17	-	-	-
3,500 - 3,999	10	10	-	-	-
4,000 - 4,499	9	9	-	-	-
4,500 - 4,999	5	5	-	-	-
5,000 & Over	7	7	-	-	-

TABLE 4

Pensions in Force on July 1, 2014
by Type of Recipient and Nearest Age

Nearest Age	Total	Pensioner	Beneficiary	Alternate Payee	Disabled
Total	117	81	29	3	4
Under 55	9	4	1	-	4
55 - 59	15	13	1	1	-
60 - 64	23	22	1	-	-
65 - 69	20	16	3	1	-
70 - 74	13	8	5	-	-
75 - 79	16	9	6	1	-
80 - 84	12	6	6	-	-
85 - 89	6	2	4	-	-
90 & over	3	1	2	-	-

Assets

Market Value of Assets

The combined market value of net assets of the North Dakota Public Employees Retirement System (PERS) and the Highway Patrolmen's Retirement System (HPRS) was $2,347,301,808 as of June 30, 2014, compared to $2,014,714,110 last year. This year's combined market value represents an increase of 16.51% from the market value one year earlier.

The market value of net assets attributable to the Highway Patrolmen's Retirement System as of July 1, 2014 was $65,666,865 compared to $57,044,084 as of July 1, 2013. The rate of return on a market value basis for the HPRS Fund was 16.29% for the year ended June 30, 2014.

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 a five-year period. 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 assets. The combined actuarial value was $1,950,401,117 as of June 30, 2014. The determination of the combined actuarial asset value is shown in Table 5. This table shows that there is approximately $397 million of appreciation that will be recognized in future years.

Chart 1 on page 12 is a graph showing the historical asset values for the HPRS Fund on both an actuarial and market value basis. Table 6 summarizes the combined investment results over the previous ten-year period. Over this period, the earnings of $879,027,300 on an actuarial value basis represented an average annual return of 5.71%. For the 2013-2014 year, the actuarial rate of return on the combined assets was 12.20%.

The total actuarial value of assets is allocated to PERS and HPRS in proportion to the reported market value of assets. This allocation is illustrated in Table 7 and results in an actuarial value of assets for HPRS as of July 1, 2014 of $54,563,383. Last year's actuarial value of assets was $49,039,331. On an actuarial basis, the rate of return on the HPRS Fund was 12.60% for the year ended June 30, 2014.

A summary of income and disbursements for 2014 and 2013 on an actuarial value basis is given in Table 8, and a summary statement of assets is shown in Table 9 for HPRS. The progress of the HPRS Fund for the last ten years is provided in Table 10. It shows that the actuarial value of assets is the highest it has been in the last 10 years. Contributions and benefit payments have increased fairly consistently over the period.

A picture of the financial development of the HPRS Fund over the last ten years is provided in Chart 2 on page 18. It shows that benefit payments and expenses currently exceed and continue to grow at a faster pace than contributions. However, during the past ten years overall, 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, investment institutions, and market indices are generally based on rates of return that reflect market changes in full.

Investment Return

For your information, the investment returns 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**
2005	14.17%	4.36%
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

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 19 illustrates the smoothing effect that results from using an actuarial value of assets.

TABLE 5

Determination of Actuarial Value of Assets (for PERS and HPRS) as of June 30, 2014 and 2013

		June 30, 2014		June 30, 2013	
Year Ending	Market Value Appreciation (Depreciation)*	Percent Deferred	Amount Deferred	Percent Deferred	Amount Deferred
June 30, 2010	$153,004,660	0%	$ 0	20%	$30,600,932
June 30, 2011	288,857,273	20%	57,771,455	40%	115,542,909
June 30, 2012	(40,138,712)	40%	(16,055,485)	60%	(24,083,227)
June 30, 2013	200,819,548	60%	120,491,729	80%	160,655,638
June 30, 2014	293,366,241	80%	234,692,993	N/A	N/A
Total Deferred as of Valuation Date			$396,900,691		$282,716,252
(a) Total Appreciation (Depreciation) for last five Plan Years			895,909,010		139,019,091
(b) Write-Up/(Down) Amount for the year - equals 20% of (a)			179,181,802		27,803,818

	June 30, 2014	June 30, 2013
Market Value of Assets	$2,347,301,808	$2,014,714,110
Less: Deferred Appreciation (Depreciation)	396,900,691	$282,716,252
Actuarial value of assets	$1,950,401,117	$1,731,997,858
Actuarial Value as a Percent of Market Value	83.1%	86.0%

* *Interest and dividends are recognized immediately. Realized and unrealized appreciation (depreciation) is spread over five years.*

CHART 1

Market Value of Assets vs. Actuarial Value of Assets (HPRS)

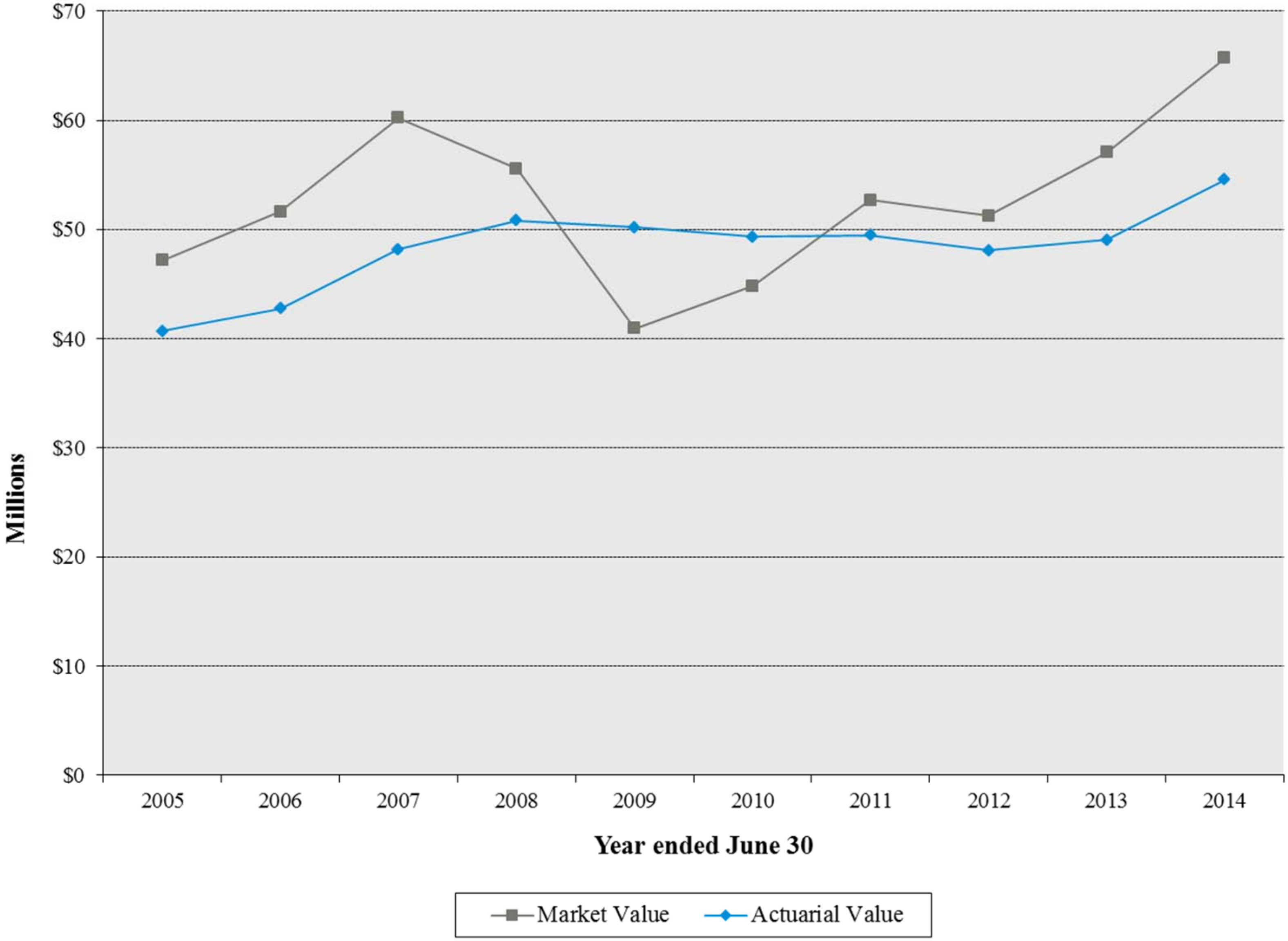


TABLE 6

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

Year Ended June 30	Net Interest and Dividend Income*		Other Income**		Total Net Investment Income	
	Amount	Yield	Amount	Yield	Amount	Yield
2005	$29,115,600	2.38%	$24,276,800	1.98%	$53,392,400	4.36%
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
Total for Last Ten Years	$312,059,800		$566,967,500		$879,027,300	
Average Yield for last Ten Years						5.71%

* *Net of investment expenses.*
** *Includes write-up (down).*

TABLE 7

Allocation of Combined (PERS and HPRS) Actuarial Value of Assets

	July 1, 2014		July 1, 2013	
	Market Value	Actuarial Value	Market Value	Actuarial Value
PERS Main System	$2,211,910,481	$1,837,902,845	$1,899,458,667	$1,632,915,720
PERS Judges	42,713,635	35,491,270	36,525,294	31,399,855
PERS National Guard	3,111,655	2,585,512	2,695,283	2,317,065
PERS Law Enforcement with prior Main System service	21,694,853	18,026,513	17,820,673	15,319,974
PERS Law Enforcement without prior Main System service	2,204,318	1,831,594	1,170,109	1,005,913
PERS Combined	$2,281,634,943	$1,895,837,734	$1,957,670,026	$1,682,958,527
Highway Patrol	65,666,865	54,563,383	57,044,084	49,039,331
Total	$2,347,301,808	$1,950,401,117	$2,014,714,110	$1,731,997,858

TABLE 8

Summary Statement of Income and Disbursements for HPRS Fund on an Actuarial Value Basis

	Year Ended June 30, 2014	Year Ended June 30, 2013
Contribution Income:		
Employer Contributions	$1,864,632	$1,586,186
Member Contributions	1,243,520	1,028,615
Service Credit Repurchases	87,418	133,169
Total Contribution Income	$3,195,570	$2,747,970
Less: Administrative Expenses	(27,983)	(29,237)
Net Contribution Income	$3,167,587	$2,718,733
Investment Income:		
Interest and Dividends	$1,160,492	$1,286,296
Less: Investment Expenses	(238,852)	(198,484)
Net Interest and Dividends	$921,640	$1,087,812
Write-up/(down) of Assets	5,219,560	910,893
Net Investment Income	$6,141,200	$1,998,705
Total Income Available for Benefit Payments and Reserves	$9,308,787	$4,717,438
Benefit Payments:		
Pension Benefits	$(3,752,627)	$(3,749,888)
Refunds	(32,108)	(22,428)
Total Benefit Payments	$(3,784,735)	$(3,772,316)
Addition to Reserve for Future Benefit Payments	$5,524,052	$945,122
Actuarial Value of Assets, Start of Year	49,039,331	48,094,209
Actuarial Value of Assets, End of Year	$54,563,383	$49,039,331

TABLE 9

Summary Statement of Assets for HPRS Fund
(based on unaudited financial statements)

	Year Ended June 30, 2014		Year Ended June 30, 2013	
Cash		$0		$0
Receivables:				
Interest receivable	$94,357		$102,248	
Due from fiduciary funds	9,189		4,672	
Total receivables		$103,546		$106,920
Investments:				
Domestic equities	$14,779,824		$12,624,309	
International equities	20,153,886		17,355,866	
International fixed income	3,254,782		2,683,469	
Domestic fixed income	12,205,301		9,905,531	
Real estate	11,481,003		10,694,399	
Alternative investments	2,987,726		2,935,038	
Invested cash	752,089		754,184	
Total investments		$65,614,611		$56,952,796
Software (net of amortization)		21,227		24,554
Total assets		$65,739,384		$57,084,270
Liabilities due to fiduciary funds		$(72,519)		$(40,186)
Net assets at market value		$65,666,865		$57,044,084
Net assets at actuarial value		$54,563,383		$49,039,331

TABLE 10

Progress of the HPRS Fund through June 30, 2014 on an Actuarial Value Basis

Year Ended June 30	Employer Contributions	Member Contributions	Administrative Expenses	Net Investment Income	Benefit Payments	Fund at End of Year
2004						$39,957,321
2005	$867,803	$535,233	$16,058	$1,799,734	$2,447,165	40,696,868
2006	931,206	574,341	17,470	3,235,491	2,662,076	42,758,360
2007	960,487	592,398	19,410	6,854,855	2,978,776	48,167,914
2008	1,058,825	649,861	18,364	4,162,228	3,211,580	50,808,884
2009	1,122,720	692,320	19,141	786,522	3,194,169	50,197,136
2010	1,196,562	741,271	18,154	610,947	3,402,152	49,325,610
2011	1,285,699	839,872	22,734	1,619,709	3,568,301	49,479,855
2012	1,423,154	907,695	26,674	(27,574)	3,662,247	48,094,209
2013	1,586,186	1,161,784	29,237	1,998,705	3,772,316	49,039,331
2014	1,864,632	1,330,938	27,983	6,141,200	3,787,735	54,563,383
Total for last ten years	$12,297,274	$8,025,713	$215,225	$27,181,817	$32,683,517	

CHART 2

Income and Disbursements for HPRS on an Actuarial Value Basis

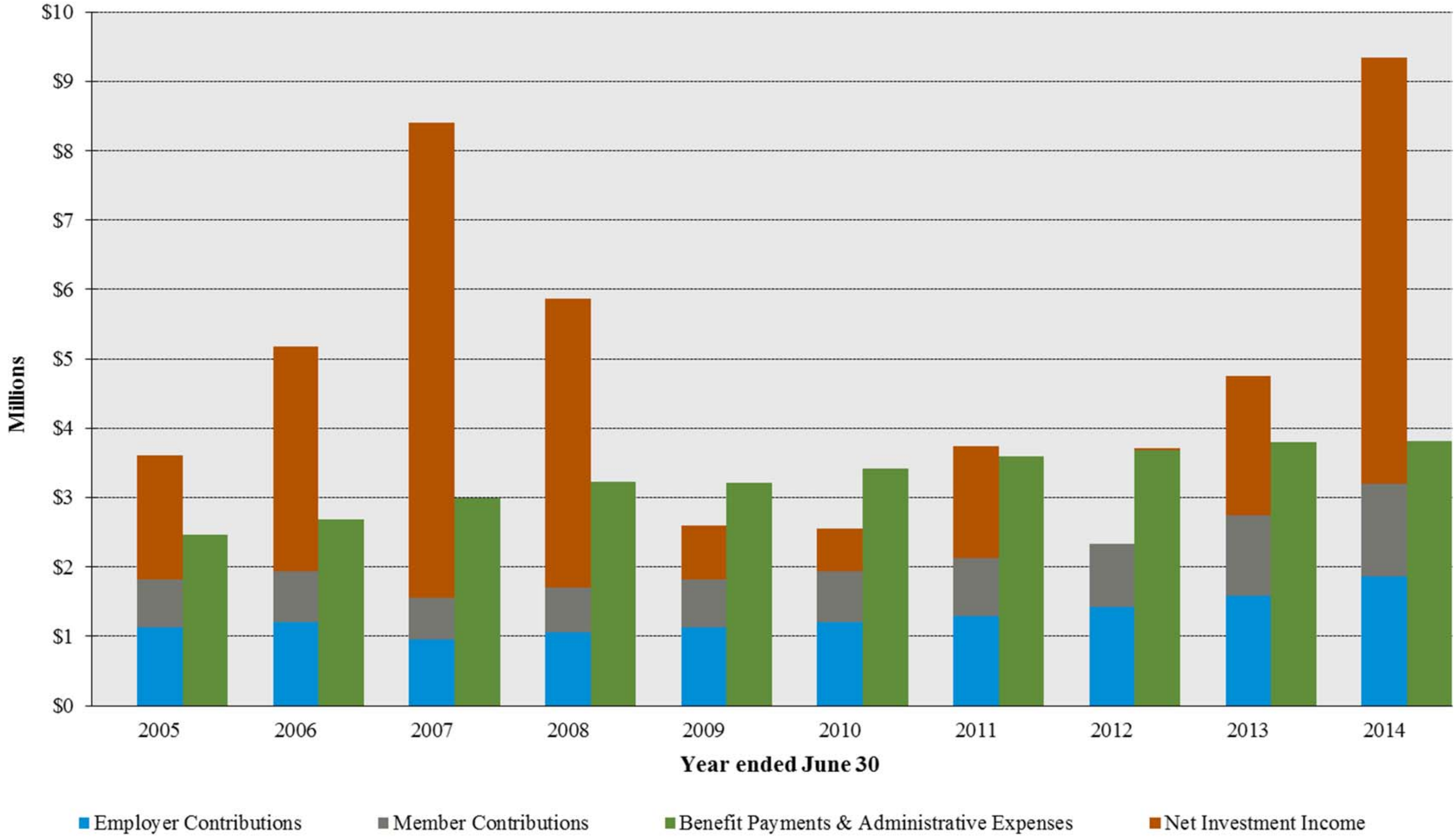
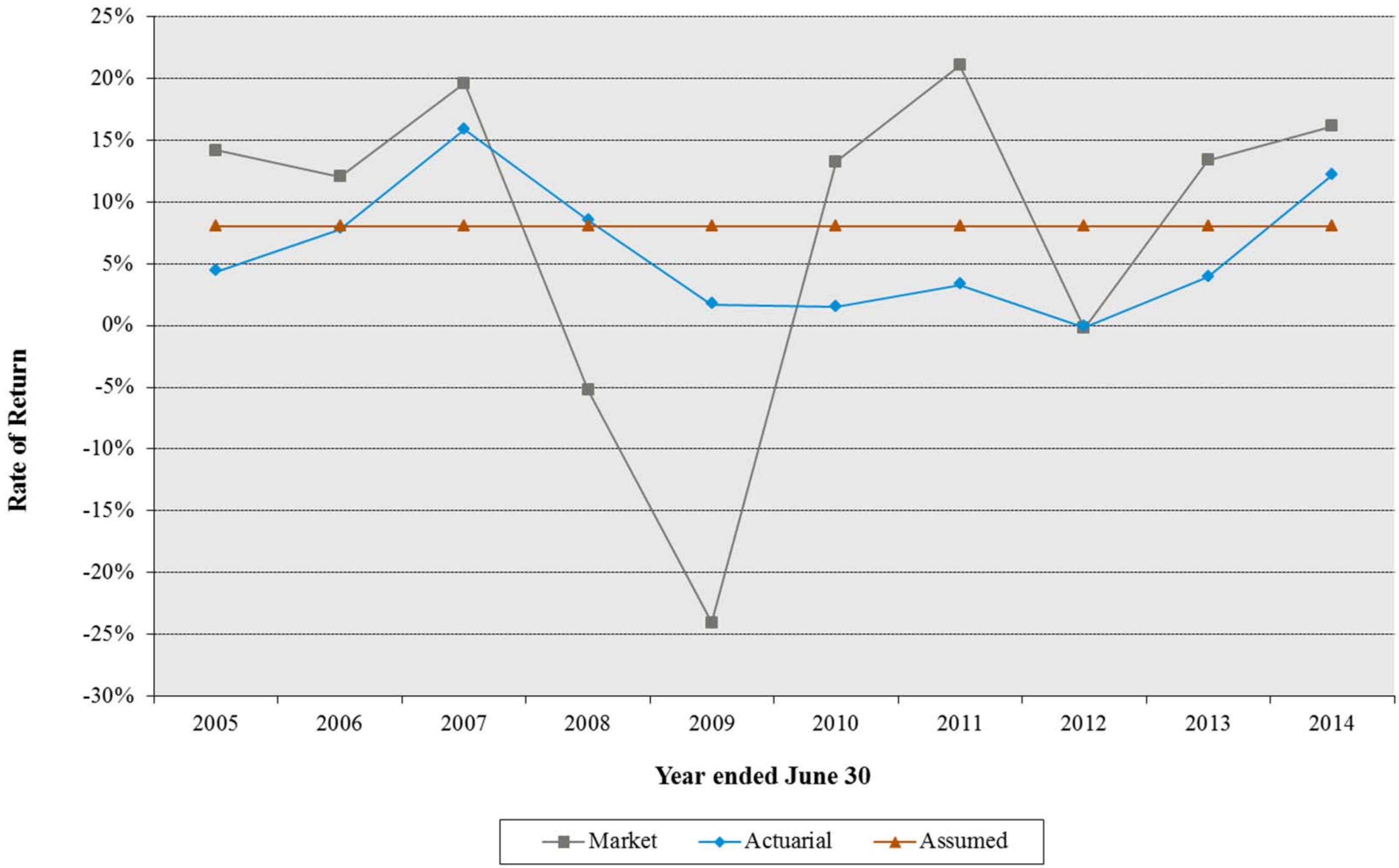


CHART 3

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 period of 20 years with increasing payments. The calculated employer contribution requirements on this basis for fiscal year 2014-2015 are shown below as a dollar amount and as a percentage of the covered payroll of contributing participants.

The components of the actuarial contribution requirement are as follows:

	Amount for 2014 – 2015	Percentage of Payroll
Total normal cost	$ 2,074,152	20.44%
Less member contributions	(1,349,380)	(13.30)
Net employer normal cost	$724,772	7.14%
Administrative expense allowance	18,000	0.18
Amortization payment	1,458,706	14.38
Total employer contribution	$2,201,478	21.70%

Covered payroll is $10,145,713 for 156 active members.

The total statutory contribution rate is 33.00% of payroll (13.30% for the member and 19.70% for the employer) as of July 1, 2014. The plan has a deficit of 2.00% of payroll. The statutory contribution along with the Board's funding policy result in a 26.6 year effective amortization period. If deferred asset appreciation were taken into account on the valuation date, the effective amortization period would be 9.3 years.

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

	As a Percentage of Payroll	Estimated Annual Dollar Cost[1]
Employer cost rate as of July 1, 2013	25.11%	$2,347,598
Investment gain	(1.60)	(162,352)
Contribution loss	0.26	26,049
Plan change (contribution rate increase)	(0.50)	(50,728)
Plan experience during the year		
• Change in payroll	(1.97)	0
• Other experience[2]	0.94	95,262
Effect of maintaining 20-year amortization schedule	(0.54)	(54,351)
Employer cost rate as of July 1, 2014	21.70%	$2,201,478

[1] *Based on payroll for each valuation date shown.*

[2] *Includes 0.06% increase for mortality loss, 0.16% increase for salary and service loss as well as the effect of other differences in actual versus expected experience including disability, withdrawal and retirement experience.*

The development of the unfunded/(surplus) actuarial accrued liability for the year ended June 30, 2014 is as follows:

1.	Unfunded/(Surplus) actuarial accrued liability as of July 1, 2013		$22,852,981
2.	Normal cost at beginning of year		1,858,371
3.	Contributions		(3,195,570)
4.	Assumed administrative expenses		18,000
5.	Interest		1,849,791
6.	Expected unfunded/(surplus) actuarial accrued liability – equals sum of (1) through (5)		$23,383,573
7.	Changes due to:		
	(a) Gain due to investments offset by contributions less than the employer contribution requirement	$(2,242,739)	
	(b) Gain due to withdrawals greater than expected	(967,409)	
	(c) Loss due to salary increases greater than expected and changes in service	231,214	
	(d) Loss due to reinstated members	116,968	
	(e) Loss due to active retirements and disability experience	114,127	
	(f) Loss due to mortality experience	74,166	
	(g) Loss due to administrative expenses	10,375	
	(h) Change in assumptions	0	
	(i) Loss due to other plan experience	181,010	
	(j) Total changes	$(2,482,288)	
8.	Unfunded/(Surplus) actuarial accrued liability as of July 1, 2014 – equals (6) plus (7m)		$20,901,285

Information Required by GASB

Governmental Accounting Standards Board (GASB) reporting information provides standardized information for comparative purposes of governmental pension plans. This information allows a reader of the financial statements to compare the funding status of one governmental plan to another on relatively equal terms.

The Governmental Accounting Standards Boards (GASB) recently approved two new Statements. Statement 67 replaces Statement 25 and is for plan reporting. Statement 68 replaces Statement 27 and governs employer reporting. It is important to note that the new GASB rules only redefine pension expense for financial reporting purposes, and do not apply to contribution amounts for actual pension funding purposes. Employers and plans can still develop and adopt funding policies under current practices. These Statements are applicable for preparing the 2013/2014 fiscal year financial statement for the Plan and for the 2014/2015 fiscal year financial statement for the employer's reporting. As requested, we have continued to use Statement 27 in preparing the financial reporting information in this report. The information required by the GASB Statement 67 will be provided in a separate report.

Table 11 shows the schedule of funding progress and includes the Plan's funded ratio.

Table 12 shows the Annual Required Contribution (ARC), Annual Pension Cost (APC) and the Net Pension Obligation (NPO) for the year ending June 30, 2014, and the prior eight fiscal years.

TABLE 11

Supplementary Information Required by GASB – Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) – (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) – (a)] / (c)
07/01/2006	$42,758,360	$49,127,046	$6,368,686	87.0%	$5,688,205	112.0%
07/01/2007	48,167,914	51,536,518	3,368,604	93.5%	6,128,867	55.0%
07/01/2008	50,808,884	54,558,943	3,750,059	93.1%	6,508,644	57.6%
07/01/2009	50,197,136	57,555,716	7,358,580	87.2%	7,009,297	105.0%
07/01/2010	49,325,610	61,782,124	12,456,514	79.8%	7,737,624	161.0%
07/01/2011	49,479,855	67,144,926	17,665,071	73.7%	8,002,340	220.7%
07/01/2012	48,094,209	68,455,622	20,361,413	70.3%	8,166,881	249.3%
07/01/2013	49,039,331	71,892,312	22,852,981	68.2%	9,348,386	244.5%
07/01/2014	54,563,383	75,464,668	20,901,285	72.3%	10,145,713	206.0%

TABLE 12

Development of the Net Pension Obligation (NPO) and the Annual Required Contribution (ARC) Pursuant to GASB 27

Plan Year Ended June 30	Employer Annual Required Contribution (a)	Employer Amount Contributed (b)	Interest on NPO (h) x 8.0% (c)	ARC Adjustment (h) / (e) (d)	Amortization Factor (e)	Pension Cost (a) + (c) – (d) (f)	Change in NPO (f) – (b) (g)	NPO Balance NPO + (g) (h)
2006	$904,817	$931,206	$(51,324)	$(44,774)	14.3286	$898,267	$(32,939)	$(674,484)
2007	1,076,146	960,487	(53,959)	(47,072)	14.3286	1,069,259	108,772	(565,712)
2008	905,591	1,058,825	(45,257)	(39,481)	14.3286	899,815	(159,010)	(724,722)
2009	1,025,737	1,122,720	(57,978)	(50,579)	14.3286	1,018,338	(104,382)	(829,104)
2010	1,312,591	1,196,562	(66,328)	(57,864)	14.3286	1,304,127	107,565	(721,539)
2011	1,744,270	1,285,699	(57,723)	(50,357)	14.3286	1,736,904	451,205	(270,335)
2012	2,170,739	1,423,154	(21,627)	(18,867)	14.3286	2,167,979	744,825	474,490
2013	2,191,076	1,586,186	37,959	33,115	14.3286	2,195,920	609,734	1,084,224
2014	2,347,598	1,864,632	86,738	75,669	14.3286	2,358,667	494,035	1,578,259

Actuarial Assumptions and Cost Methods

The actuarial assumptions and cost methods used in the actuarial valuation as of July 1, 2014 are the same as those used in the previous valuation. A summary of the actuarial assumptions and cost methods follows. Details can be found in Exhibit II.

Investment Yield

The actuarial calculations are based on the assumption that the investment return on the actuarial value of assets of the System will be 8.00% per year, net of investment expenses.

Salary Increases

Because the retirement benefits provided by the System are based on a member's final average salary, increases in salaries affect the employer's contribution requirements. A salary scale is used in an actuarial valuation to project each member's future salary increases.

During each of the first five years of service, the assumed salary increase depends on the number of years of service. After five years of service, salary increases are age-related.

Inflation

The assumed inflation rate is 3.50% per annum.

Payroll Growth

The assumed payroll growth rate is 4.50% per annum.

Retirement

Retirement rates reflect the expected percentage of members who will retire at each age. From ages 50 to 54, 25% of the members who are not eligible for early retirement under the Rule of 80 are assumed to retire each year. In the first year of eligibility for unreduced retirement (age 55 or Rule of 80), 75% of the members are assumed to retire. Beyond that first year of eligibility for unreduced retirement, 100% of members are assumed to retire.

Those retiring with a reduced benefit are assumed to delay commencement until they satisfy the Rule of 80 if that is more valuable.

Inactive vested members eligible for deferred benefits are assumed to retire at age 55.

Withdrawal Rates Before Retirement

Withdrawal rates used in this actuarial valuation are intended to reflect the percentage of employees who will leave service at each age prior to retirement for reasons other than death or disability.

During the first year of service the assumed withdrawal rate is 10%. For each of the next four years of service, the assumed withdrawal rate is 5% per year. After five years of service, the assumed withdrawal rate is 2.5% per year for those under age 35 and 1% per year for those age 35 and older. No withdrawal is assumed once the employee has reached eligibility for early retirement.

Disability Incidence Rates Before Retirement

Disability rates used in this actuarial valuation are intended to reflect the percentage of employees who will leave service at each age prior to retirement due to disability. The assumed disability incidence rates increase from 0.05% at age 25 to 0.55% at age 55.

Mortality Rates

The reserve required to pay a member's retirement benefits depends on the period over which payments will be received. The valuation uses the RP 2000 Combined Healthy Mortality Table set back one year for healthy members and the RP 2000 Disabled Retiree Mortality Table set back one year for males (not set back for females) for disabled members. The table below shows sample mortality rates and life expectancies underlying the healthy mortality tables.

Retired Members

	Males		Females	
Age	Deaths per 1,000 Lives	Expected Number of Years of Life Remaining	Deaths per 1,000 Lives	Expected Number of Years of Life Remaining
55	3.2	26.6	2.4	29.3
60	5.9	22.1	4.4	24.8
65	11.3	17.9	8.6	20.4
70	19.8	14.1	14.9	16.5
75	33.9	10.7	25.5	12.9
80	57.9	7.8	41.5	9.8
85	99.8	5.4	69.5	7.1

Administrative Expenses

Annual administrative expenses are assumed to be $18,000.

Marital Status for Non-Retired Members

At retirement or death, 90% of non-retired members are assumed to have spouses. Males are assumed to be three years older than their female spouses.

Valuation of Assets

Investments are carried at an adjusted market value. The net market appreciation (depreciation) is spread over five years in equal dollar amounts, beginning with the year of occurrence. The actuarial value of assets is the market value less deferred appreciation (depreciation). 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.

Actuarial Cost Method

The System is funded using the Entry Age Normal Actuarial Cost Method. This method produces costs that will remain relatively level as a percentage of covered payroll.

Under the Entry Age Normal Method, the total contribution requirement has three components - an annual normal cost, an allowance for administrative expenses and a payment with respect to the unfunded actuarial accrued liability. The annual normal cost is calculated for each member as the level percentage of pay required over the member's period of covered employment to pay the total expected benefits, with the normal cost determined as if the current benefit accrual rate had always been in effect. If the actuarial assumptions are met, the total normal cost rate will remain level as a percentage of payroll.

The normal cost payments are sufficient to finance the benefit program only if there are no changes in plan design and all actuarial assumptions are realized. To the extent that actual experience is less favorable than assumed, additional liabilities not funded through normal cost payments arise. Also, benefit liberalizations that improve earned benefits or benefit eligibility produce additional liabilities.

The Board has adopted a policy of calculating an amortization payment for the Unfunded Actuarial Accrued Liability (UAAL) by using an open period of 20 years. The annual payments are determined as a level percent of payroll, with payroll expected to increase 4.50% per year. This results in a payment towards the UAAL that is less than interest on the UAAL. Under this method, the UAAL is projected to grow from year to year, even if the actuarially required contribution was made and all actuarial assumptions were met.

Actuarial Valuation Certificate

November 14, 2014

NORTH DAKOTA HIGHWAY PATROLMEN'S RETIREMENT SYSTEM

This is to certify that Segal Consulting ("Segal") has prepared an Actuarial Valuation of the System as of July 1, 2014 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 Qualification 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
Tammy F. Dixon, FSA, MAAA, EA
Vice President & Actuary

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

EXHIBIT I

ACTUARIAL VALUATION RESULTS

1.	Actuarial accrued liability on July 1, 2014:		
	a. Active members	$33,551,227	
	b. Retired members and beneficiaries	38,336,057	
	c. Inactive non-retired members	3,577,384	
	d. Total		$75,464,668
2.	Assets at actuarial value ($65,666,865 at market value)		54,563,383
3.	Unfunded (Surplus) actuarial accrued liability - equals (1) minus (2)		20,901,285
4.	Member and employer normal cost for ensuing year*		2,074,152
5.	Estimated annual salaries of covered members		10,145,713
6.	Member normal cost equals - 13.30% of (5)		1,349,380
7.	Employer normal cost for ensuing year - equals (4) minus (6)		724,772
8.	Amortization payment equals 20-year amortization of item (3) as a level percent of aggregate salary*		1,458,706
9.	Administrative expenses		18,000
10.	Total employer cost for ensuing year - equals (7) plus (8) plus (9)		2,201,478
11.	Total employer cost as percentage of payroll - equals (10) divided by (5)		21.70%

* *Adjusted for interest to recognize payments throughout the year.*

EXHIBIT II

ACTUARIAL ASSUMPTIONS AND COST METHODS

1. <u>Mortality Tables</u>:

Healthy: RP-2000 Combined Healthy Mortality Table set back one year.

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

Sample healthy rates are as follows:

	Rate (%)	
Age	**Male**	**Female**
25	0.04	0.02
30	0.04	0.02
35	0.07	0.04
40	0.10	0.06
45	0.14	0.10
50	0.20	0.16
55	0.32	0.24
60	0.59	0.44
65	1.13	0.86

These mortality tables were determined to contain approximately a 10% margin for future mortality improvement, based on a review of mortality experience in 2010. We recommend an update to the 2010 experience study be performed in the 2014/2015 Plan Year.

2. <u>Disability Incidence Rates</u>:

Sample rates are as follows:

Age	Rate
25	0.05%
30	0.12
35	0.20
40	0.30
45	0.37
50	0.38
55	0.55

EXHIBIT II (continued)

3. **Annual Withdrawal Rates:**

First year of service:	10% per year.
Second through fifth years of service:	5% per year.
After five years of service:	
Under age 35:	2.5% at each age.
Age 35 and older:	1% at each age.

Withdrawal rates end upon eligibility for early retirement (age 50 and 10 years of service).

4. **Refund of Employee Contributions:**

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

5. **Retirement Rates:**

The following annual rates apply for active members:

Age	Early Retirement	First Year Eligible for Unreduced Retirement*	After First Year Eligible for Unreduced Retirement*
50 and Over	25%**	75%	100%

* *Age 55 and 10 years of service or Rule of 80*

** *Those retiring with a reduced benefit are assumed to delay commencement until they satisfy the Rule of 80 if that is more valuable.*

Inactive vested members eligible for deferred benefits are assumed to retire at age 55.

6. **Net Investment Return:**

8.00% per annum, net of investment expenses.

7. **Inflation:**

3.50% per annum.

8. **Annual Administrative Expenses:**

$18,000.

EXHIBIT II (continued)

9. Salary Scale:

Less than five years of service:

Service	Percentage Increase
0	8.25%
1	7.25
2	6.75
3	6.50
4	6.25

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

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

10. Payroll Growth:

4.50% per annum.

11. Percent Married and Age of Spouse:

At retirement or death, 90% of non-retired members are assumed to have spouses. Males are assumed to be three years older than their female spouses.

12. Workers' Compensation:

None assumed for disability benefit offset.

13. Indexing for Benefits of Inactive Vested Members:

4.50% per annum.

14. Split Service:

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

15. Transfers to PERS System:

Annual withdrawal, disability incidence and retirement rate assumptions for members who have transferred to the PERS System follow those specified in the PERS System, and are applied to the benefits held in the HPRS.

EXHIBIT II (continued)

16. **Actuarial Cost Method:**

Entry Age Normal Actuarial Cost Method. The annual normal cost is calculated for each member as the level percentage of pay required over the member's period of covered employment to pay the total expected benefits. The normal cost is determined as if the current benefit accrual rate had always been in effect. The unfunded actuarial accrued liability is amortized in installments assuming a 4.50% payroll growth assumption and an open 20-year period.

17. **Actuarial Value of Assets:**

Adjusted market value that immediately recognizes interest and dividends. The procedure recognizes 20% of each Plan 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.

18. **Benefit Election:**

Married participants are assumed to elect the 50% joint and survivor annuity, and non-married participants are assumed to elect the life annuity.

EXHIBIT III

CHANGES IN ACTUARIAL ASSUMPTIONS AND COST METHODS

There were no changes in actuarial assumptions or cost methods since the prior valuation.

EXHIBIT IV

SUMMARY OF PLAN PROVISIONS

This exhibit summarizes the major benefit provisions of the North Dakota Highway Patrolmen's 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:

Attainment of age 55 with at least 10 years of eligible employment, or at any age with age plus service equal to at least 80 (Rule of 80).

Benefit:

3.60% of final average salary for each of the first 25 years of service plus 1.75% of final average salary for service in excess of 25 years.

2. Early Retirement:

Eligibility:

Attainment of age 50 with 10 years of eligible employment.

Benefit:

The Normal Service Retirement benefit as determined above, reduced by one-half of one percent for each month before age 55.

3. Disability Benefit:

Eligibility:

Accumulation of six months of service and inability to engage in substantial gainful activity.

Benefit:

70% of the member's final average salary at disability minus workers' compensation, with a minimum of $100 per month.

EXHIBIT IV (continued)

4. **Deferred Vested Retirement:**

Eligibility:

Ten years of eligible employment.

Benefit:

The Normal Service Retirement benefit payable at age 55 or the Rule of 80, if earlier. Vested benefits are indexed at a rate set by the Retirement Board based on the increase in final average salary from date of termination to benefit commencement date, as follows:

Year Beginning	Average Annual Increase	Three-Year Average Increase	Cumulative Salary Increase
7/1/1994	3.00%	3.01%	3.01%
7/1/1995	2.00	2.86	5.95
7/1/1996	2.00	2.33	8.42
7/1/1997	3.00	2.33	10.95
7/1/1998	1.80	2.27	13.47
7/1/1999	1.26	2.02	15.76
7/1/2000	2.00	1.69	17.71
7/1/2001	1.81	1.69	19.70
7/1/2002	1.73	1.85	21.91
7/1/2003	0.00	1.18	23.35
7/1/2004	0.00	0.58	24.06
7/1/2005	4.00	1.33	25.72
7/1/2006	4.00	2.67	29.07
7/1/2007	4.00	4.00	34.23
7/1/2008	4.00	4.00	39.60
7/1/2009	5.00	4.33	45.65
7/1/2010	5.00	4.67	52.45
7/1/2011	2.00	4.00	58.55
7/1/2012	2.00	3.00	63.30
7/1/2013	3.00	2.33	67.11
7/1/2014	3.00	2.67	70.11

Reduced early retirement benefits can be elected upon attainment of age 50.

EXHIBIT IV (continued)

5. <u>Pre-Retirement Death Benefits</u>:

(a) Eligibility:

Ten years of eligible employment.

Benefit:

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) for the surviving spouse's lifetime.

(b) Eligibility:

Less than 10 years of service.

Benefit:

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

6. <u>Normal and Optional Forms of Payment</u>:

Normal form of payment:

Monthly benefit for life with 50% of the benefit continuing for the life of the surviving spouse (if any).

Optional forms of payment:

- 100% joint and survivor annuity
- Twenty-year certain and life annuity
- Ten-year certain and life 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 or a deferred normal retirement option.

EXHIBIT IV (continued)

7. Final Average Salary:

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

8. Contributions:

Member contributions as a percent of monthly salary: 13.30%

Member contributions earn interest at an annual rate of 7.50% compounded monthly.

State contributions as a percent of monthly salary for each participating member: 19.70%

EXHIBIT V

CHANGES IN PLAN PROVISIONS

As a result of legislation passed in 2013, the member and employer contribution rates were increased in January of 2014 by the following amounts:

Member:	1.00%
Employer:	1.00%

5337383v1/01640.001