

NORTH DAKOTA
HIGHWAY PATROLMEN'S RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JULY 1, 2016

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October 19, 2016

Board Members

North Dakota Highway Patrolmen's Retirement System
Bismarck, North Dakota

Members of the Board:

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

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

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

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

In the actuarial valuation as of July 1, 2015, projected future benefits for future retirees were assumed to be limited by the Internal Revenue Code (IRC) Section 415 limits applicable to the current year (2015). Beginning with the actuarial valuation as of July 1, 2016, the actuarial assumption was updated to reflect that projected future benefits for future retirees will be limited by a projected IRC 415 limit that is assumed to increase from the current year limit by the current inflation assumption of 3.50 percent.

The plan provisions were unchanged from last actuarial valuation as of July 1, 2015.

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

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

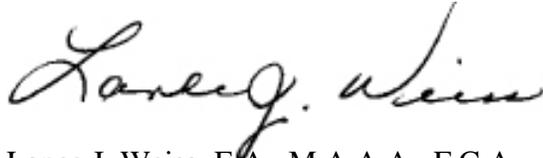
The signing actuaries are independent of the plan sponsor.

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

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

Respectfully submitted,

Gabriel, Roeder, Smith & Company



Lance J. Weiss, E.A., M.A.A.A., F.C.A.
Senior Consultant and Team Leader



Amy Williams, A.S.A., M.A.A.A., F.C.A.
Consultant

cc: Mr. Sparb Collins, NDPERS
Ms. Sharon Schiermeister, NDPERS
Mr. Bryan Reinhardt, NDPERS

SECTION A
VALUATION RESULTS

COMMENTS ON THE VALUATION

Purpose

At your request, we have performed an actuarial valuation of the North Dakota Highway Patrolmen's Retirement System as of July 1, 2016.

The purposes of this actuarial valuation are as follows:

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

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

Membership Data

We received the data from the NDPERS Staff. We performed certain checks for reasonableness and found the data to be complete and reliable for valuation purposes. However, we did not audit the data.

A total of 156 active members were included in the valuation as of July 1, 2016. Between the 2015 and 2016 valuations, the number of active employees decreased by 5 members, or 3.1 percent. The average annual valuation pay increased by 9.0 percent, from \$61,908 to \$67,479 between the 2015 and 2016 valuation. There were 7 active members that were eligible for retirement (normal, early or Rule of 80) as of July 1, 2016.

The number of benefit recipients decreased from 128 to 123, or 3.9 percent, since the last valuation. The average monthly benefit increased by 1.6 percent, from \$3,058 to \$3,107. During the year ending June 30, 2016, there were no members awarded a benefit.

There were 22 inactive members as of July 1, 2016, who were vested and elected to receive a deferred benefit. The average monthly deferred benefit is \$ 185. There were 17 inactive members as of July 1, 2016, who elected to receive a refund of contributions.

There were 12 members that were previously in the HPRS that transferred to the PERS.

Section C summarizes the membership data.

Plan Provisions

Section F outlines the principal benefit provisions of the System. There were no changes since the previous valuation. The Board set the rate at 2% for the indexing percentage for the year beginning July 1, 2016, applicable to the final average salaries of System deferred vested members.

Actuarial Assumptions and Methods

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

Starting with the July 1, 2016, actuarial valuation, projected future benefits for future retirees are limited by the projected IRC 415 limit that is assumed to increase from the current year limit by the

COMMENTS ON THE VALUATION (CONTINUED)

current inflation assumption of 3.50 percent. The current IRC 415 limit for 2016 is \$210,000.

Section E outlines the actuarial assumptions and methods used in the actuarial valuation. The actuarial assumption for administrative expenses is equal to the prior years' administrative expenses, adjusted for inflation. In total, the administrative expense assumption has increased from \$32,007 to \$32,551.

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

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

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

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

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

Plan Asset Return

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

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

Gain/Loss Analysis

During the plan year ending June 30, 2016, the unfunded actuarial accrued liability ("UAAL") increased from \$21,236,686 as of July 1, 2015, to \$26,188,050 as of July 1, 2016, which is an increase of \$4,951,364. The key factors contributing to the increase in the UAAL were (1) the change in assumption to limit future benefits based on projected IRC Section 415 limits and (2) the recognition of asset losses in the actuarial value of assets. The unfunded actuarial accrued liability based on the market value of assets is \$22,110,623.

COMMENTS ON THE VALUATION (CONTINUED)

Funded Ratio

The funded ratio measures the portion of the actuarial accrued liability (calculated based on the actuarial assumptions disclosed in this report) that is currently funded. The funded ratio is 70.2 percent on an actuarial value of assets basis and 74.9 percent on a market value of assets basis.

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

Employer Contributions

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

The contributions that are made by employers are based on fixed contribution rates that are set by statute (and not based on the actuarially determined rate). The statutory contribution rate of 19.7% is lower than the actuarial contribution rate of 27.11%.

The portion of the statutory contribution that is applied toward the unfunded liability is the statutory contribution rate minus the employer normal cost rate. The unfunded liability contribution rate from the statutory contribution is lower than the rate calculated using the 20-year level percentage of payroll amortization period. (The equivalent amortization period of the unfunded liability rate from the statutory contribution rate is 67.0 years based on the actuarial value of assets and 42.3 years based on the market value of assets.)

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

Historical Trends

The funded ratio has declined during the past 10 years from a high of 94 percent in 2007 to the current funded ratio of 70 percent. The actuarial contribution rate has increased as the funded ratio has decreased.

ACTUARIAL VALUATION RESULTS

	Valuation as of July 1, 2015		Valuation as of July 1, 2016	
	Total	% of Payroll	Total	% of Payroll
Active Members				
Number	161		156	
Average Age	35.3		36.4	
Average Years of Benefit Service	8.6		9.6	
Average Years of Vesting Service	9.2		10.1	
Total Payroll	\$ 9,967,249		\$ 10,526,791	
Projected Annual Compensation	10,774,341		11,287,197	
Inactive Members (Vested and Non-Vested)				
Number	37		39	
Total Benefits (Vested)	NA		\$ 587,031	
Total Accumulated Contributions (Non-vested)	NA		\$ 315,225	
Retired Members and Beneficiaries				
Number	128		123	
Total Benefits	\$ 4,697,134		\$ 4,586,664	
Total Membership	326		318	
Actuarial Accrued Liability				
Active Members	\$ 25,987,773		\$ 33,990,450	
Inactive Members (Vested and Non-Vested)	3,816,342		5,176,476	
Retired Members and Beneficiaries	50,308,102		48,755,034	
Total	80,112,217		87,921,960	
Actuarial Value of Assets	\$ 58,875,531		\$ 61,733,910	
Unfunded Actuarial Accrued Liability	\$ 21,236,686		\$ 26,188,050	
Funded Ratio (Actuarial Value of Assets)	73.5%		70.2%	
Annual Gross Normal Cost				
Benefits	\$ 2,226,286	(20.66%)	\$ 2,701,326	(23.93%)
Expenses of Administration	32,007	(0.30%)	32,551	(0.29%)
Total	2,258,293	(20.96%)	2,733,877	(24.22%)
Amortization of Unfunded Liability ¹	\$ 1,482,114	(13.76%)	\$ 1,827,671	(16.19%)
Annual Contribution Requirement:				
Employer Portion	\$ 2,307,420	(21.42%)	\$ 3,060,351	(27.11%)
Employee Portion	1,432,987	(13.30%)	1,501,197	(13.30%)
Total	3,740,407	(34.72%)	4,561,548	(40.41%)
Actuarial Contribution	\$ 2,307,420	(21.42%)	\$ 3,060,351	(27.11%)
Statutory Employer Contribution	2,122,545	(19.70%)	2,223,578	(19.70%)
Statutory Contribution Deficit/(Surplus)	184,875	(1.72%)	836,773	(7.41%)
Amortization Period from Statutory Rate (Years)	24.3		67.0	
<u>Results Based on Market Value of Assets</u>				
Market Value of Assets	\$ 66,675,728		\$ 65,811,337	
Unfunded Actuarial Accrued Liability	\$ 13,436,489		\$ 22,110,623	
Funded Ratio (Market Value of Assets)	83.2%		74.9%	
Total Annual Gross Normal Cost	2,258,293	(20.96%)	2,733,877	(24.22%)
Amortization of Unfunded Liability ¹	\$ 937,736	(8.70%)	\$ 1,543,106	(13.67%)
Annual Contribution Requirement:				
Employer Portion	\$ 1,763,042	(16.36%)	\$ 2,775,786	(24.59%)
Employee Portion	1,432,987	(13.30%)	1,501,197	(13.30%)
Total	3,196,029	(29.66%)	4,276,983	(37.89%)
Actuarial Contribution	\$ 1,763,042	(16.36%)	\$ 2,775,786	(24.59%)
Statutory Employer Contribution	2,122,545	(19.70%)	2,223,578	(19.70%)
Statutory Contribution Deficit/(Surplus)	(359,503)	(-3.34%)	552,208	(4.89%)
Amortization Period from Statutory Rate (Years)	13.0		42.3	

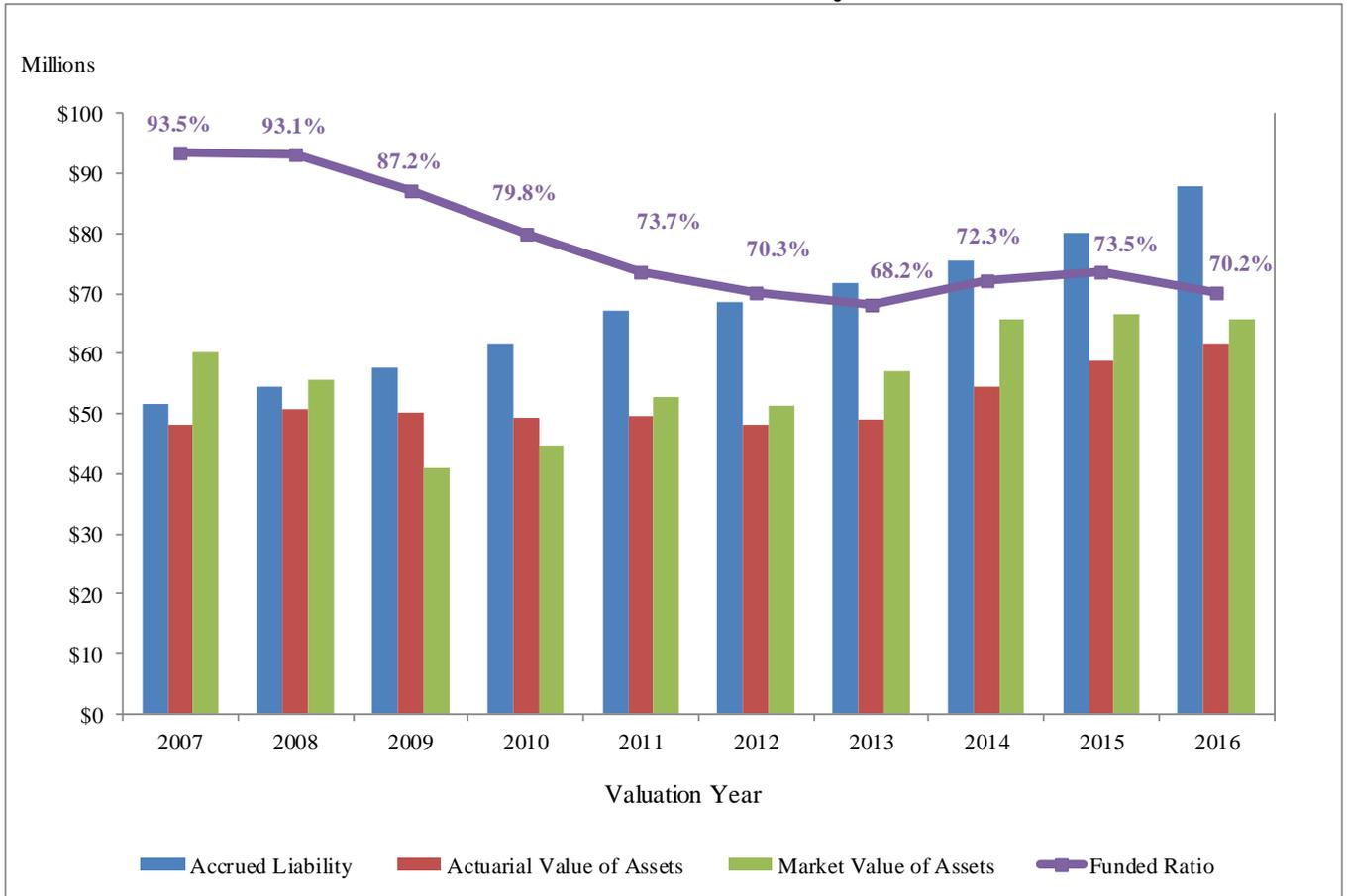
¹ Amortization as a level percentage of payroll over a 20-year open period. Total payroll assumed to increase by 4.50%.

ACTUARIAL VALUATION RESULTS GAIN/LOSS ANALYSIS

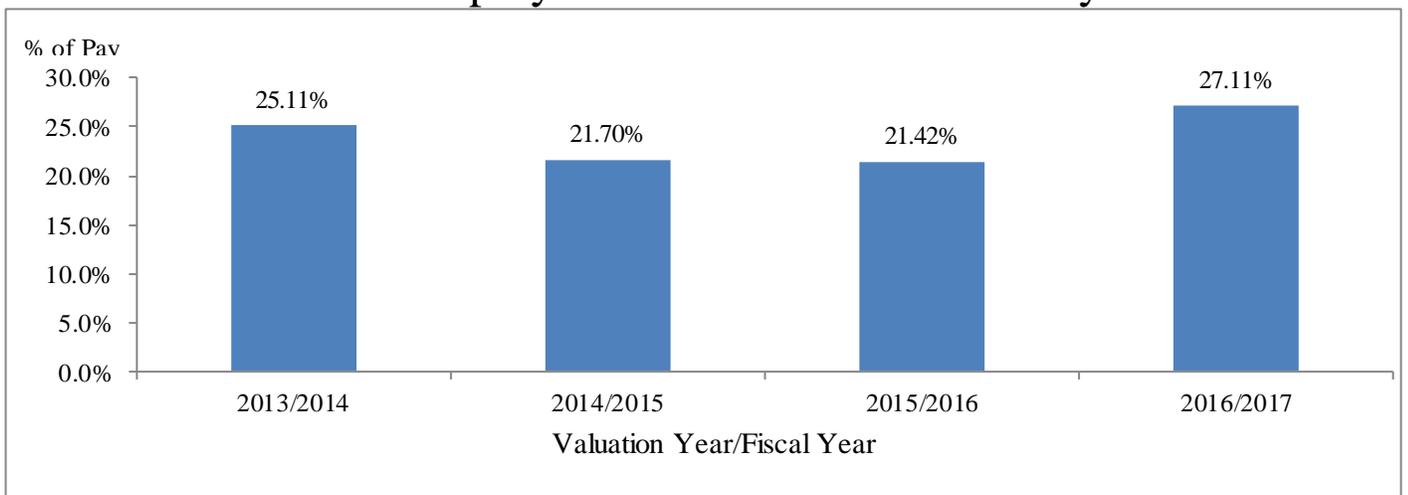
Unfunded liability at previous valuation	\$ 21,236,686
Unfunded liability at previous valuation - GRS replication results	\$ 25,182,487
<u>Expected unfunded liability at current valuation</u>	
Normal cost for plan year	2,616,207
Interest on unfunded liability and normal cost	2,117,234
Contributions using actuarial rate with interest to current valuation date	<u>4,545,282</u>
Total expected change in unfunded liability at current valuation	188,159
Total expected unfunded liability at current valuation	25,370,646
Change due to:	
Amount and timing of contributions (based on statutory rate)	841,890
Amount and timing of administrative expenses	(579)
Recognition of asset (gains)/losses	623,964
Salary experience	(547,785)
Retirement experience	(17,157)
Withdrawal experience	34,419
Disability experience	(11,700)
Death in Service experience	16,311
Death After Retirement experience	(673,671)
New entrants	68,662
Data changes and other experience	483,050
Change in actuarial assumptions	-
Changes in plan provisions	-
Total change	<u>817,404</u>
Unfunded liability at current valuation	\$ 26,188,050
<hr/>	
FY 2016 Actuarial Employer Contribution	21.42%
GRS Replication Results FY 2016 Actuarial Employer Contribution	27.48%
Expected FY 2017 Actuarial Employer Contribution	26.89%
Change due to:	
Amount and timing of contributions	0.52%
Amount and timing of administrative expenses	-0.01%
Recognition of asset (gains)/losses	0.39%
Salary experience	-0.41%
Retirement experience	-0.01%
Withdrawal experience	0.02%
Disability experience	-0.01%
Death in Service experience	0.01%
Death After Retirement experience	-0.41%
New entrants	-0.17%
Data changes and other experience	0.30%
Change in actuarial assumptions	0.00%
Changes in plan provisions	<u>0.00%</u>
Total change	0.22%
FY 2017 Actuarial Employer Contribution	27.11%
FY 2017 Statutory Contribution Rate	19.70%

HISTORICAL TRENDS OF FUNDED RATIO AND EMPLOYER CONTRIBUTIONS

Funded Ratio History



Actuarial Employer Contribution Rate History

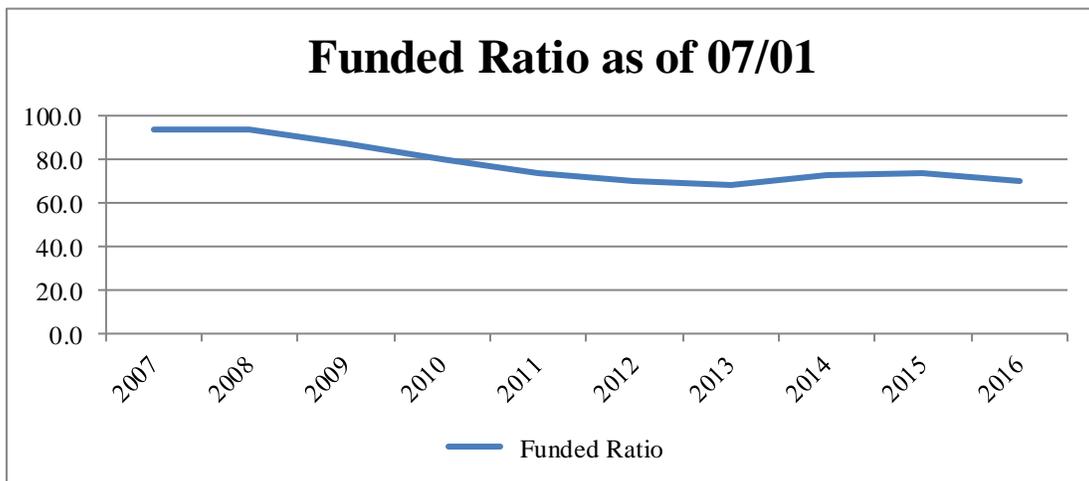


**ACTUARIAL VALUATION RESULTS
SOLVENCY TEST (\$ IN MILLIONS)**

Valuation Date 6/30	Total Actuarial Accrued Liability	(1)	(2)	(3)	Actuarial Value of Assets	Portion (%) of Present Value Covered By Assets		
		Active Member Contributions	Retirees, Term Vested and Beneficiaries	Active Members (Employer Financed Portion)		(1)	(2)	(3)
2007	\$ 51.5	\$ 9.5	\$ 30.5	\$ 11.5	\$ 48.2	100%	100%	71%
2008	54.6	9.5	32.6	12.5	50.8	100%	100%	70%
2009	57.6	10.0	34.3	13.3	50.2	100%	100%	44%
2010	61.8	10.5	36.1	15.2	49.3	100%	100%	18%
2011	67.1	11.6	37.4	18.1	49.5	100%	100%	3%
2012	68.5	12.1	39.3	17.1	48.1	100%	92%	0%
2013	71.9	13.5	40.5	17.9	49.0	100%	88%	0%
2014	75.5	14.8	41.9	18.8	54.6	100%	95%	0%
2015	80.1	12.3	54.1	13.7	58.9	100%	86%	0%
2016	88.0	14.3	53.9	19.7	61.7	100%	88%	0%

FUNDED RATIO HISTORY

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)
07/01/2007	\$ 48,167,914	\$ 51,536,518	\$ 3,368,604	93.5 %
07/01/2008	50,808,884	54,558,943	3,750,059	93.1
07/01/2009	50,197,136	57,555,716	7,358,580	87.2
07/01/2010	49,325,610	61,782,124	12,456,514	79.8
07/01/2011	49,479,855	67,144,926	17,665,071	73.7
07/01/2012	48,094,209	68,455,622	20,361,413	70.3
07/01/2013	49,039,331	71,892,312	22,852,981	68.2
07/01/2014	54,563,383	75,464,668	20,901,285	72.3
07/01/2015	58,875,531	80,112,217	21,236,686	73.5
07/01/2016	61,733,910	87,921,960	26,188,050	70.2



SECTION B
ASSET EXHIBITS

STATEMENT OF FIDUCIARY NET POSITION

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

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

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

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

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

ACTUARIAL VALUE OF ASSETS BY PLAN (PERS AND HPRS)

Valuation as of July 1, 2016

	Main System	Judges	Law Enforcement with Prior	Law Enforcement without Prior	Highway Patrol	Total	Total PERS
Market Value of Assets	\$ 2,324,783,623	\$ 44,269,616	\$ 42,406,694	\$ 3,435,724	\$ 65,811,337	\$ 2,480,706,994	\$ 2,414,895,657
% of Total	93.71%	1.78%	1.71%	0.14%	2.65%	100.00%	97.35%
Actuarial Value of Assets	\$ 2,180,748,616	\$ 41,526,834	\$ 39,779,332	\$ 3,222,859	\$ 61,733,910	\$ 2,327,011,551	\$ 2,265,277,641
% of Total	93.71%	1.78%	1.71%	0.14%	2.65%	100.00%	97.35%
Ratio of Actuarial Value to Market Value	93.80%	93.80%	93.80%	93.80%	93.80%	93.80%	93.80%
Difference between Market Value and Actuarial Value	\$ 144,035,007	\$ 2,742,782	\$ 2,627,362	\$ 212,865	\$ 4,077,427	\$ 153,695,443	\$ 149,618,016

Valuation as of July 1, 2015

	Main System	Judges	Law Enforcement with Prior	Law Enforcement without Prior	Highway Patrol	Total	Total PERS
Market Value of Assets	\$ 2,296,088,880	\$ 44,137,412	\$ 28,691,976	\$ 2,792,541	\$ 66,675,728	\$ 2,438,386,537	\$ 2,371,710,809
% of Total	94.16%	1.81%	1.18%	0.11%	2.73%	100.00%	97.27%
Actuarial Value of Assets	\$ 2,027,476,214	\$ 38,973,906	\$ 25,335,386	\$ 2,465,850	\$ 58,875,531	\$ 2,153,126,887	\$ 2,094,251,356
% of Total	94.16%	1.81%	1.18%	0.11%	2.73%	100.00%	97.27%
Ratio of Actuarial Value to Market Value	88.30%	88.30%	88.30%	88.30%	88.30%	88.30%	88.30%
Difference between Market Value and Actuarial Value	\$ 268,612,666	\$ 5,163,506	\$ 3,356,590	\$ 326,691	\$ 7,800,197	\$ 285,259,650	\$ 277,459,453

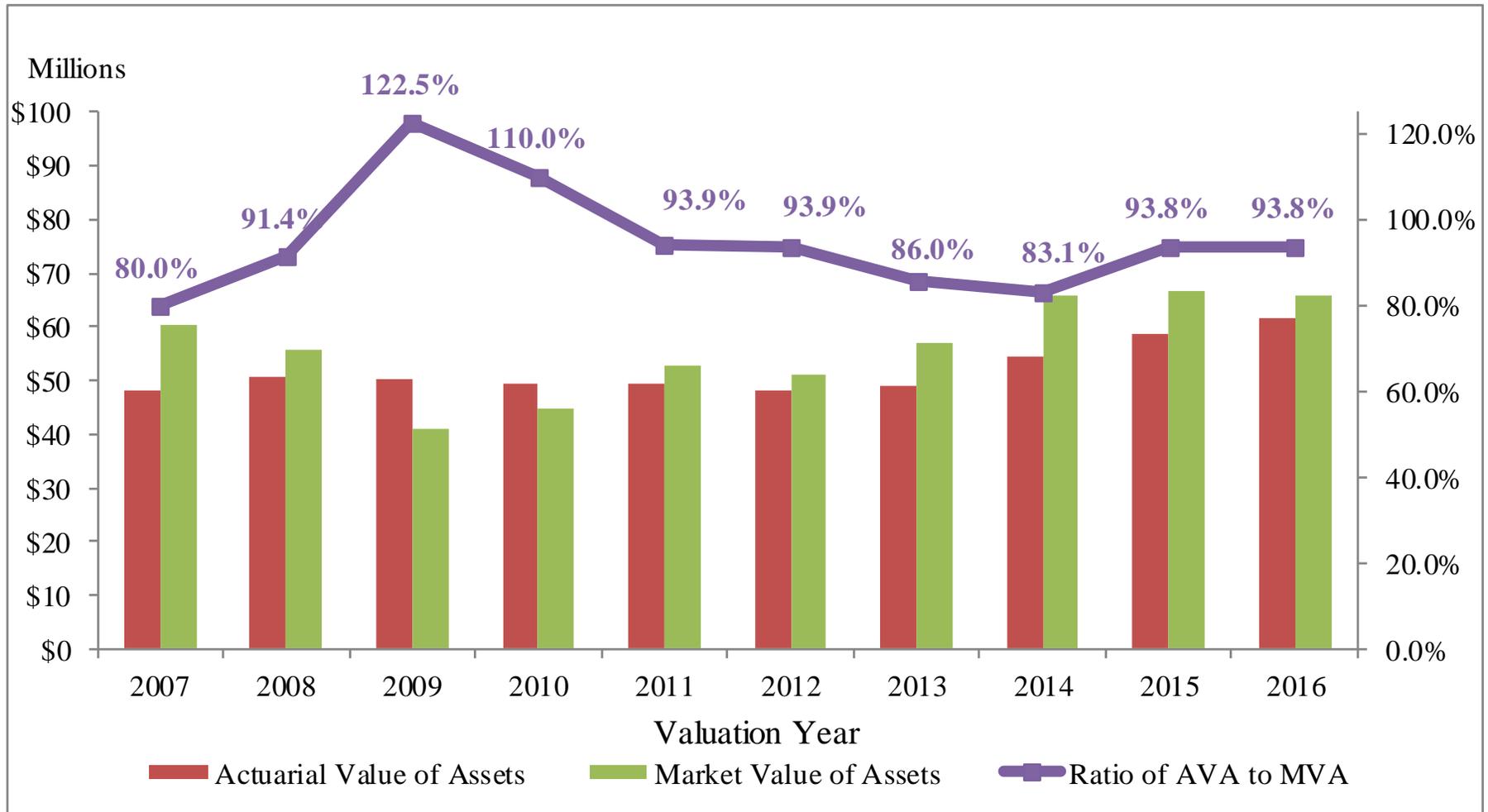
Market value of assets by plan provided by NDPERS Staff.

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

CHANGES IN ACTUARIAL VALUE OF ASSETS (HPRS)

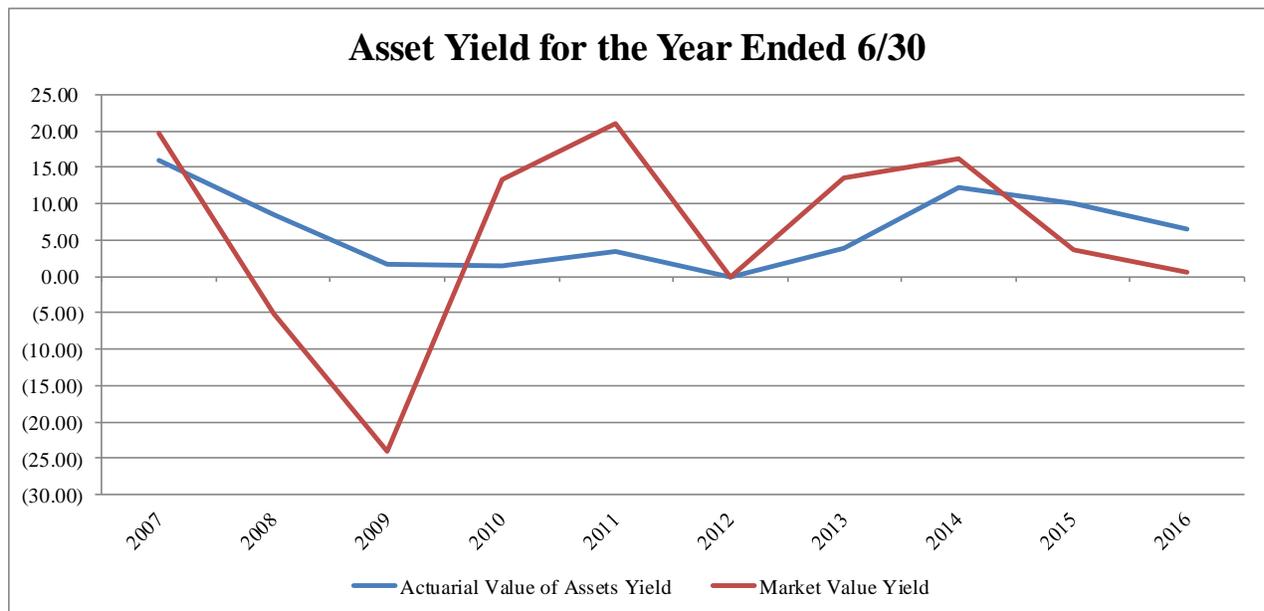
Date	Employer Contributions	Member Contributions	Administrative Expenses	Benefit Payments and Refunds	Investment Income	Actuarial Value of Assets at End of Year	Market Value of Assets at End of Year
07/01/2007	\$ 960,487	\$ 592,398	\$ (19,410)	\$ (2,978,776)	\$ 6,854,855	\$ 48,167,914	\$ 60,209,892
07/01/2008	1,058,825	649,861	(18,364)	(3,211,580)	4,162,228	50,808,884	55,587,776
07/01/2009	1,122,720	692,320	(19,141)	(3,194,169)	786,522	50,197,136	40,973,927
07/01/2010	1,196,562	741,271	(18,154)	(3,402,152)	610,947	49,325,610	44,838,156
07/01/2011	1,285,699	839,872	(22,734)	(3,568,301)	1,619,709	49,479,855	52,705,421
07/01/2012	1,423,154	907,695	(26,674)	(3,662,247)	(27,574)	48,094,209	51,243,115
07/01/2013	1,586,186	1,161,784	(29,237)	(3,772,316)	1,998,705	49,039,331	57,044,084
07/01/2014	1,864,632	1,330,938	(27,983)	(3,787,735)	6,141,200	54,563,383	65,666,865
07/01/2015	2,002,291	1,448,227	(30,925)	(4,745,510)	5,638,065	58,875,531	66,675,728
07/01/2016	2,127,355	1,436,236	(31,450)	(4,713,495)	4,039,733	61,733,910	65,811,337
10-Year Total	14,627,911	9,800,602	(244,072)	(37,036,281)	31,824,390		

HISTORICAL COMPARISON OF ACTUARIAL VALUE OF ASSETS TO MARKET VALUE OF ASSETS (HRPS)



HISTORICAL COMPARISON OF TOTAL INVESTMENT INCOME (TOTAL PERS AND HRPS)

Actuarial Valuation Date	Net Interest and Dividend Income*		Other Income		Total Investment Income (Actuarial Assets Basis)		Total Investment Income (Market Value of Assets)
	Amount**	Yield	Amount**	Yield	Amount**	Yield	Yield
07/01/2007	\$ 34,727,000	2.58 %	\$ 178,771,700	13.26 %	\$ 213,498,700	15.84 %	19.63 %
07/01/2008	32,819,700	2.13	98,332,000	6.38	131,151,700	8.51	(5.21)
07/01/2009	29,260,400	1.77	(964,400)	(0.05)	28,296,000	1.72	(24.05)
07/01/2010	25,938,200	1.57	(1,337,500)	(0.09)	24,600,700	1.48	13.25
07/01/2011	28,830,100	1.74	26,013,200	1.57	54,843,300	3.31	21.09
07/01/2012	36,570,500	2.17	(39,020,800)	(2.32)	(2,450,300)	(0.15)	(0.20)
07/01/2013	37,884,500	2.27	27,803,800	1.66	65,688,300	3.93	13.41
07/01/2014	32,503,200	1.87	179,181,800	10.33	211,685,000	12.20	16.15
07/01/2015	37,696,600	1.93	157,815,800	8.08	195,512,400	10.01	3.57
07/01/2016	50,762,900	2.34	92,164,400	4.25	142,927,300	6.59	0.46
10-Year Total	346,993,100	2.04	718,760,000	4.31	1,065,753,100	6.34	5.81



* Net interest and dividend income is net of investment expenses

**Amount rounded to the nearest \$100

SECTION C
MEMBERSHIP DATA

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

	Actives	Retirees	Alternate Payees	Disabled	Beneficiaries	Deferred Vested	Inactive Members	Transfers	Totals
Total Participants July 1, 2015:	161	92	5	4	27	11	11	15	326
New Entrants and Rehires	1								1
Net Transfers	(2)						(1)	3	0
Data Corrections/Other Changes:						2	(2)		0
Vested Terminations:	(2)					2			0
Non-Vested Terminations:	(2)						2		0
Disabled:									0
Retirements:									0
Deaths with Beneficiary:		(2)			2				0
Deaths w/o Beneficiary:		(2)							(2)
New former spouse									0
Expired Annuity or Stop Payment:					(3)	3	(2)	(5)	(7)
Continuing:	155	88	5	4	24	11	6	10	303
Net Changes:	(5)	(4)	0	0	(1)	7	(3)	(2)	(8)
Total Participants July 1, 2016:	156	88	5	4	26	18	8	13	318

Including transfers, 22 members are valued with deferred vested benefits from the Highway Patrolmen's Retirement System and 17 members are valued as a return of contributions for Highway Patrol service.

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

	<u>Valuation as of</u> <u>July 1, 2015</u>	<u>Valuation as of</u> <u>July 1, 2016</u>
Active Members		
Number	161	156
Average Age	35.3	36.4
Average Benefit Service	8.6	9.6
Average Vesting Service	9.2	10.1
Total Payroll	\$ 9,967,249	\$ 10,526,791
Inactive Members¹		
Number	11	22
Total Benefits	\$ 26,995	\$ 48,919
Inactive Members Elected Refunds¹		
Number	26	17
Total Account Balance	\$ 860,756	\$ 315,225
Disabled Members		
Number	4	4
Total Benefits	\$ 8,761	\$ 8,761
Retired Members		
Number	92	88
Total Benefits	\$ 346,234	\$ 334,207
Beneficiaries		
Number	27	26
Total Benefits	\$ 31,546	\$ 34,368
QDROs (Alternate Payees)		
Number	5	5
Total Benefits	\$ 4,886	\$ 4,886
Total Membership	326	318

¹ Includes Transfers.

AGE/SERVICE/SALARY AS OF JULY 1, 2016

Total	Vesting Service as of Valuation Date									Totals	Valuation Payroll	Contribution Account Balance
	Current Age	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35 and Over			
Under 20	-	-	-	-	-	-	-	-	-	0	\$ -	\$ -
20-24	8	-	-	-	-	-	-	-	-	8	431,795	93,542
25-29	21	10	-	-	-	-	-	-	-	31	1,773,917	729,001
30-34	14	16	9	-	-	-	-	-	-	39	2,475,701	2,015,056
35-39	2	7	10	7	-	-	-	-	-	26	1,863,307	2,558,611
40-44	1	5	8	7	2	-	-	-	-	23	1,711,341	2,910,117
45-49	-	4	1	4	7	5	-	-	-	21	1,639,649	4,295,322
50-54	-	1	1	-	3	2	-	-	-	7	552,589	1,493,443
55-59	-	-	-	-	1	-	-	-	-	1	78,492	245,396
60-64	-	-	-	-	-	-	-	-	-	0	-	-
65-69	-	-	-	-	-	-	-	-	-	0	-	-
70-74	-	-	-	-	-	-	-	-	-	0	-	-
75 and Over	-	-	-	-	-	-	-	-	-	0	-	-
Total	46	43	29	18	13	7	0	0	156	\$ 10,526,791	\$ 14,340,488	

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

Previous Valuation		Current Valuation		Change
Average Age:	35.3	Average Age:	36.4	1.1
Average Vesting Service:	9.2	Average Vesting Service:	10.1	0.9
Average Annual Pay:	\$61,908	Average Annual Pay:	\$67,479	\$5,571
Average Account Balance:	\$76,474	Average Account Balance:	\$91,926	\$15,452
Vested Participants	56	Vested Participants	67	11
Nonvested Participants	105	Nonvested Participants	89	(16)
Total Participants	161	Total Participants	156	(5)

Current Age	Annualized Salary as of Valuation Date										Totals
	Less Than \$20,000	\$20,000-\$29,999	\$30,000-\$39,999	\$40,000-\$49,999	\$50,000-\$59,999	\$60,000-\$69,999	\$70,000-\$79,999	\$80,000-\$89,999	\$90,000-\$99,999	\$100,000 & Over	
Under 20	-	-	-	-	-	-	-	-	-	-	0
20-24	-	-	-	-	8	-	-	-	-	-	8
25-29	-	-	-	-	24	7	-	-	-	-	31
30-34	-	-	-	1	13	19	5	1	-	-	39
35-39	-	-	-	-	2	15	7	-	1	1	26
40-44	-	-	-	-	1	11	7	2	-	2	23
45-49	-	-	-	-	-	10	6	1	1	3	21
50-54	-	-	-	-	-	3	2	1	-	1	7
55-59	-	-	-	-	-	-	1	-	-	-	1
60-64	-	-	-	-	-	-	-	-	-	-	0
65-69	-	-	-	-	-	-	-	-	-	-	0
70-74	-	-	-	-	-	-	-	-	-	-	0
75 and Over	-	-	-	-	-	-	-	-	-	-	0
Total	0	0	0	1	48	65	28	5	2	7	156

HISTORICAL SCHEDULE OF ACTIVE MEMBER DATA THROUGH JULY 1, 2016

Valuation Date 7/1	Highway Patrol			
	Number	Annual Payroll (\$ in Millions)	Average Annual Pay ¹	% Increase in Avg Pay
2007	133	\$ 6.1	\$ 46,082	2.9%
2008	130	6.5	50,066	8.6%
2009	133	7.0	52,701	5.3%
2010	139	7.7	55,666	5.6%
2011	133	8.0	60,168	8.1%
2012	145	8.2	56,323	(6.4)%
2013	149	9.3	62,741	11.4%
2014	156	10.1	65,037	3.7%
2015	161	10.8	66,921	2.9%
2016	156	10.5	67,479	0.8%

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

SUMMARY OF ACTIVE MEMBER DATA AS OF JULY 1, 2016

Summary of Active Member Eligibility for Benefits

Active Members Eligible For:	Total
Retirement	
Normal	1
Rule of 80	0
Early Retirement	<u>6</u>
Total Retirement	7
Deferred Retirement	<u>60</u>
Total Vested	67
Non-Vested	89
Grand Total	156

Transfers

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

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

Highway Patrol						
Monthly Amount	Normal	Early	Disability	Service*	Beneficiary**	Total
Under \$200	0	0	0	0	3	3
\$200 - \$400	0	0	0	0	4	4
\$400 - \$600	0	0	0	0	0	0
\$600 - \$800	0	0	0	0	2	2
\$800 - \$1,000	0	0	0	0	2	2
\$1,000 - \$1,200	1	0	0	0	4	5
\$1,200 - \$1,400	1	0	0	0	7	8
\$1,400 - \$1,600	0	0	1	0	2	3
\$1,600 - \$1,800	0	0	0	0	2	2
\$1,800 - \$2,000	0	0	0	0	0	0
\$2,000 - \$2,200	2	1	1	1	1	6
\$2,200 - \$2,400	4	0	1	0	0	5
\$2,400 - \$2,600	3	0	0	4	2	9
\$2,600 - \$2,800	1	0	0	5	0	6
\$2,800 - \$3,000	1	0	1	5	0	7
\$3,000 - \$3,200	2	0	0	7	0	9
\$3,200 - \$3,400	1	0	0	2	0	3
\$3,400 - \$3,600	1	0	0	6	1	8
\$3,600 - \$3,800	2	0	0	2	0	4
\$3,800 - \$4,000	0	0	0	2	0	2
\$4,000 - \$4,200	0	0	0	2	1	3
\$4,200 - \$4,400	0	0	0	4	0	4
\$4,400 - \$4,600	1	0	0	4	0	5
\$4,600 - \$4,800	1	0	0	4	0	5
\$4,800 - \$5,000	0	0	0	2	0	2
\$5,000 and Over	2	0	0	14	0	16
Total	23	1	4	64	31	123
Payment Option	Normal	Early	Disability	Service*	Beneficiary**	Total
Life	0	0	0	0	1	1
Level Social Security Payment	0	0	0	0	0	0
Joint & 100% Survivor	8	0	0	37	3	48
Joint & 50% Survivor	15	1	4	27	27	74
5 Year C & L	0	0	0	0	0	0
10 Year C & L	0	0	0	0	0	0
Total	23	1	4	64	31	123
Age	Normal	Early	Disability	Service*	Beneficiary**	Total
Under 50	0	0	2	0	1	3
50 - 54	0	0	2	12	1	15
55 - 59	3	0	0	12	2	17
60 - 64	3	0	0	18	2	23
65 - 69	4	0	0	10	5	19
70 - 74	0	0	0	10	4	14
75 - 79	1	1	0	2	6	10
80 - 84	9	0	0	0	4	13
85 - 89	3	0	0	0	5	8
90 and Over	0	0	0	0	1	1
Total	23	1	4	64	31	123

	Previous Valuation	Current Valuation
Average Age	66.9	67.3
Average Monthly Benefit	\$3,058	\$3,107
Total Members in Pay Status	128	123

* Includes Rule of 80.

** Includes alternate payees.

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

Highway Patrol						
Monthly Amount	Normal	Early	Disability	Service*	Beneficiary**	Total
Under \$200	0	0	0	0	0	0
\$200 - \$400	0	0	0	0	0	0
\$400 - \$600	0	0	0	0	0	0
\$600 - \$800	0	0	0	0	0	0
\$800 - \$1,000	0	0	0	0	0	0
\$1,000 - \$1,200	0	0	0	0	0	0
\$1,200 - \$1,400	0	0	0	0	0	0
\$1,400 - \$1,600	0	0	0	0	0	0
\$1,600 - \$1,800	0	0	0	0	1	1
\$1,800 - \$2,000	0	0	0	0	0	0
\$2,000 - \$2,200	0	0	0	0	0	0
\$2,200 - \$2,400	0	0	0	0	0	0
\$2,400 - \$2,600	0	0	0	0	0	0
\$2,600 - \$2,800	0	0	0	0	0	0
\$2,800 - \$3,000	0	0	0	0	0	0
\$3,000 - \$3,200	0	0	0	0	0	0
\$3,200 - \$3,400	0	0	0	0	0	0
\$3,400 - \$3,600	0	0	0	0	0	0
\$3,600 - \$3,800	0	0	0	0	0	0
\$3,800 - \$4,000	0	0	0	0	0	0
\$4,000 - \$4,200	0	0	0	0	1	1
\$4,200 - \$4,400	0	0	0	0	0	0
\$4,400 - \$4,600	0	0	0	0	0	0
\$4,600 - \$4,800	0	0	0	0	0	0
\$4,800 - \$5,000	0	0	0	0	0	0
\$5,000 and Over	0	0	0	0	0	0
Total	0	0	0	0	2	2
Payment Option	Normal	Early	Disability	Service*	Beneficiary	Total
Life	0	0	0	0	0	0
Level Social Security Payment	0	0	0	0	0	0
Joint & 100% Survivor	0	0	0	0	1	1
Joint & 50% Survivor	0	0	0	0	1	1
5 Year C & L	0	0	0	0	0	0
10 Year C & L	0	0	0	0	0	0
Total	0	0	0	0	2	2
Age	Normal	Early	Disability	Service*	Beneficiary	Total
Under 50	0	0	0	0	0	0
50 - 54	0	0	0	0	0	0
55 - 59	0	0	0	0	0	0
60 - 64	0	0	0	0	2	2
65 - 69	0	0	0	0	0	0
70 - 74	0	0	0	0	0	0
75 - 79	0	0	0	0	0	0
80 - 84	0	0	0	0	0	0
85 - 89	0	0	0	0	0	0
90 and Over	0	0	0	0	0	0
Total	0	0	0	0	2	2
	Previous Valuation		Current Valuation			
New Pensions Awarded	N/A		2			
Average Age	N/A		61.3			
Average Monthly Benefit	N/A		\$2,857			

*Includes Rule of 80.

**Includes alternate payees.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

Highway Patrol		Years of Vesting Service					Total	
		<10	10-15	15-19	20-24	25-29		>=30
2012	Number of Retirees	1	1	4	6	58	17	87
	Average Monthly Benefit	\$1,456	\$2,054	\$2,135	\$2,598	\$3,277	\$3,708	\$3,227
	Average Years of Service	2.25	11.17	17.10	22.14	27.92	31.25	27.19
2013	Number of Retirees	1	1	4	6	58	16	86
	Average Monthly Benefit	\$1,456	\$2,054	\$2,135	\$2,598	\$3,277	\$3,708	\$3,227
	Average Years of Service	2.25	11.17	17.10	22.14	27.92	31.31	27.15
2014	Number of Retirees	1	1	4	6	56	17	85
	Average Monthly Benefit	\$1,456	\$2,054	\$2,135	\$2,598	\$3,315	\$4,222	\$3,354
	Average Years of Service	2.25	11.17	17.10	22.14	27.89	31.27	27.15
2015	Number of Retirees	1	1	5	5	66	18	96
	Average Monthly Benefit	\$1,456	\$2,054	\$2,135	\$2,777	\$3,751	\$4,359	\$3,689
	Average Years of Service	2.25	11.17	17.18	22.20	27.84	31.16	27.18
2016	Number of Retirees	1	1	4	4	63	19	92
	Average Monthly Benefit	\$1,456	\$2,054	\$2,135	\$2,741	\$3,756	\$4,387	\$3,728
	Average Years of Service	2.25	11.17	17.11	22.46	27.90	31.22	27.42

Includes retired and disabled members.

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

Highway Patrol

Year	Beg of Year		Added to Rolls		Removed from Rolls		End of Year Balance		Average	% Increase
	No.	Ann. Benefits*	No.	Ann. Benefits*	No.	Ann. Benefits*	No.**	Ann. Benefits*	Annual Benefit	in Annual Benefit
Retirement										
2007	100	\$ 2,799,646	4	\$ 177,564	(3)	(\$13,795)	101	\$ 2,963,415	\$ 29,341	5.8%
2008	101	2,963,415	7	256,680	(3)	(48,925)	105	3,171,170	30,202	7.0%
2009	105	3,171,170	8	249,776	(4)	(96,523)	109	3,324,423	30,499	4.8%
2010	109	3,324,423	5	191,085	(1)	(13,126)	113	3,502,382	30,995	5.4%
2011	113	3,502,382	2	58,150	0	0	115	3,560,532	30,961	1.7%
2012	115	3,560,532	3	179,349	(2)	(45,783)	116	3,694,098	31,846	3.8%
2013	116	3,694,098	4	169,974	(4)	(114,418)	116	3,749,654	32,325	1.5%
2014	116	3,749,654	2	138,200	(1)	(64,069)	117	3,823,785	32,682	2.0%
2015	117	3,823,785	16	967,969	(5)	(94,620)	128	4,697,134	36,696	22.8%
2016	128	4,697,134	2	68,562	(7)	(179,032)	123	4,586,664	37,290	-2.4%

* \$ in millions

**Includes alternate payees.

SECTION D

GASB STATEMENT NO. 67 SCHEDULES

GASB STATEMENT NO. 67

Discussion

Accounting Standard

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

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

Financial Statements

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

Notes to Financial Statements

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

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

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

GASB STATEMENT NO. 67

(CONTINUED)

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

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

Required Supplementary Information

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

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

Timing of the Valuation

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

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

Single Discount Rate

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

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

Effective Date and Transition

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

GASB STATEMENT NO. 67
(CONTINUED)

Executive Summary
as of June 30, 2016

	Highway Patrol
Actuarial Valuation Date	07/01/2016
Measurement Date of the Net Pension Liability	07/01/2016
Plan's Fiscal Year Ending Date (Reporting Date) for GASB 67	06/30/2016
 Membership	
Number of	
- Retirees and Beneficiaries	123
- Inactive, Nonretired Members	39
- Active Members	156
- Total	318
Covered Payroll	\$ 10,526,791
 Net Pension Liability	
Total Pension Liability	\$ 87,921,960
Plan Fiduciary Net Position	65,811,337
Net Pension Liability	\$ 22,110,623
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	74.85 %
Net Pension Liability as a Percentage of Covered Payroll	210.04 %
 Development of the Single Discount Rate	
Single Discount Rate	8.00 %
Long-Term Expected Rate of Investment Return	8.00 %
Long-Term Municipal Bond Rate*	2.85 %
Last year ending June 30 in the 2016 to 2115 projection period for which projected benefit payments are fully funded	2115

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

GASB STATEMENT NO. 67
(CONTINUED)

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

Last 10 Fiscal Years (which may be built prospectively)

FY Ending 30-Jun	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll ¹	Net Pension Liability as a % of Covered Payroll
2014	\$ 75,432,901	\$65,666,865	\$ 9,766,036	87.05%	\$9,348,386	104.47%
2015	80,112,217	66,675,728	13,436,489	83.23%	10,145,713	132.44%
2016	87,921,960	65,811,337	22,110,623	74.85%	10,526,791	210.04%

¹ Prior to the valuation as of July 1, 2016, covered payroll is based on projected annual compensation. Beginning with the valuation as of July 1, 2016, covered payroll is based on annualized payroll as of the valuation date.

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

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

Current Single Discount		
1% Decrease	Rate Assumption	1% Increase
7.00%	8.00%	9.00%
\$ 33,272,054	\$ 22,110,623	\$ 12,830,376

GASB STATEMENT NO. 67
(CONTINUED)

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

Fiscal Year Ending June 30,	2016
Total pension liability	
Service cost	\$ 2,226,286
Interest on the total pension liability	6,311,403
Changes of benefit terms	0
Difference between expected and actual experience	39,748
Changes of assumptions ¹	3,945,801
Benefit payments and refunds	(4,713,495)
Net change in total pension liability	7,809,743
Total pension liability - beginning	80,112,217
Total pension liability - ending (a)	\$ 87,921,960
Plan fiduciary net position	
Contributions - Employer	\$ 2,127,355
Contributions - Employee	1,436,236
Contributions - Service credit repurchases	0
Pension plan net investment income	309,099
Benefit payments and refunds	(4,713,495)
Pension plan administrative expense	(31,450)
Transfers and Other Income	7,864
Net change in plan fiduciary net position	(864,391)
Plan fiduciary net position - beginning	66,675,728
Plan fiduciary net position - ending (b)	\$ 65,811,337
Net pension liability - ending (a) - (b)	\$ 22,110,623
Plan fiduciary net position as a percentage	
of total pension liability	74.85 %
Covered-employee payroll	\$ 10,526,791
Net pension liability as a percentage	
of covered-employee payroll	210.04 %

¹Includes difference in liability due to change in actuary and updated assumption to limit projected benefits to the projected Internal Revenue Code Section 415 limit which projects the limit at the actuarial valuation year by the inflation assumption used in the actuarial valuation.

GASB STATEMENT NO. 67
(CONTINUED)

System Asset Allocation

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

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

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

GASB STATEMENT NO. 67
(CONTINUED)

Schedule of Contributions Multiyear
Last 10 Fiscal Years

FY Ending 30-Jun	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll ¹	Actual Contribution as a % of Covered Payroll
2014	\$ 2,347,598	\$ 1,864,632	\$ 482,966	\$ 9,348,386	19.95 %
2015	2,201,479	2,002,291	199,188	10,145,713	19.74 %
2016	2,307,420	2,127,355	180,065	10,526,791	20.21 %

¹ Prior to the valuation as of July 1, 2016, covered employee payroll is based on projected annual compensation. From the valuation as of July 1, 2016, covered employee payroll is based on pensionable payroll for membership data used in the actuarial valuation.

Ten fiscal years will be built prospectively.

GASB STATEMENT NO. 67 (CONTINUED)

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

Methods and Assumptions Used to Determine Actuarially Determined Contribution Rates:

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

Other Information:

Notes There were no benefit changes during the year.
Beginning with the actuarial valuation as of July 1, 2016, projected benefits are limited to a projected Internal Revenue Code Section 415 limit which projects the limit at the actuarial valuation year by the inflation assumption used in the actuarial valuation.
The actuarial assumptions were adopted by the Board and are based on an experience study covering the period July 1, 2009, through June 30, 2014.
The employer rate to the System is the statutory contribution rate of 19.70% of payroll.

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

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

Other Information:

Notes There were no benefit changes during the year.
Beginning with the actuarial valuation as of July 1, 2016, projected benefits are limited to a projected Internal Revenue Code Section 415 limit which projects the limit at the actuarial valuation year by the inflation assumption used in the actuarial valuation.
The actuarial assumptions were adopted by the Board and are based on an experience study covering the period July 1, 2009, through June 30, 2014.
The employer rate to the System is the statutory contribution rate of 19.70% of payroll.

SECTION E
VALUATION PROCEDURES

ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS

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

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

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

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

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

Valuation Assumptions

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

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

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

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

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

From time-to-time it becomes appropriate to modify one or more of the assumptions, to reflect experience trends (but not random year-to-year fluctuations). Thus, an experience review of the North Dakota Highway Patrolmen's Retirement System for the period July 1, 2009, to July 1, 2014, was performed by the prior actuary to compare the demographic and economic experience against the actuarial assumptions used in the valuation. The actuarial assumptions described in this section were adopted by the Board for use beginning with the July 1, 2015, valuation.

ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS (CONTINUED)

Additional information regarding the rationale for the actuarial assumptions may be found in the 2015 experience review report. **The experience review was performed by the prior actuary.** All actuarial assumptions are expectations of future experience, not current market measures.

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

VALUATION ASSUMPTIONS

Current Valuation Assumptions and Methods

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

The assumed rate of price inflation is 3.50 percent.

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

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

Service At Beginning of Year	Increase Rate
0	15.00%
1	10.00%
2	8.00%
Age*	
Under 36	8.00%
36 - 40	7.50%
41 - 49	6.00%
50+	5.00%

**Age-based salary increase rates apply for employees with three or more years of service.*

The assumed rate of total payroll growth used in amortizing the unfunded liability as a level percentage of pay is 4.50 percent.

The assumed rate of benefit indexing for inactive vested benefits is 4.00 percent.

Application of Internal Revenue Code Section 415 Limits

Benefits for future retirees are assumed to be limited by the IRC Section 415 limits.

The limit for retirement ages of 62 and older is \$210,000 in 2016. The limits for retirement ages before age 62 are reduced from age 62 for early commencement using 5.0% interest, beginning of month payments, the 2016 Applicable Mortality Table (as published in IRS Notice 2015-53), and assumes forfeitable accrued benefits upon death prior to retirement.

The projected limits are assumed to increase by 3.50 percent annually.

**VALUATION ASSUMPTIONS
(CONTINUED)**

The mortality assumptions are as follows:

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

* Rates multiplied by 125 percent.

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

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

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

**VALUATION ASSUMPTIONS
(CONTINUED)**

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

Service Beginning of Year	Service and Age-Based Rates For First Five Years of Service
Year	Rates
0	10.00%
1	5.00%
2	5.00%
3	5.00%
4	5.00%
Age	Rates
Under 35	2.50%
35+	1.00%

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

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

Withdrawal rates end upon eligibility for early retirement.

Early retirement eligibility is as follows:
Age 50 and 10 years of service.

**VALUATION ASSUMPTIONS
(CONTINUED)**

Rates of disability:

Before age 65: Males: 20% of OASDI disability incidence rates.
 Females: 10% of OASDI disability incidence rates.
 Age 65 and later: 0.25% per year.

Rates of disability were as follows:

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

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

Age	Rates
50	20.00%
51	20.00%
52	20.00%
53	20.00%
54	20.00%
55+	100.00%

Assumed Service

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

Marital Status:

It is assumed that 100 percent of participants have an eligible spouse at the time of retirement or pre-retirement death. The male spouse is assumed to be three years older than the female spouse. Spouses are assumed to be the opposite sex of the employees and retirees. The relatively low rate of same-sex spouses does not have a material actuarial impact on the actuarial valuation results.

**VALUATION ASSUMPTIONS
(CONTINUED)**

Form of Payment Election Assumption:	Form of Payment 50% Joint and Survivor	Election Percentage 100%
Benefit Service:	Exact fractional years of service are used to determine the amount of benefit payable.	
Decrement Timing:	Retirement is assumed to occur at the beginning of the year. All decrements are assumed to occur at the middle of the year.	
Decrement Operation:	Turnover decrements do not operate after the member reaches retirement eligibility (early or normal).	
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.	
Pay Increase Timing:	Beginning of (fiscal) year.	
Expenses:	Assumed administrative expenses were added to the Normal Cost and are based on the prior year's expenses, adjusted for inflation. The assumed amount added to the Normal Cost is:	

Expenses		
Assumed FY 2016	\$	32,007
Actual FY 2016		31,450
Assumed FY 2017		32,551

Changes in Actuarial Valuation Assumptions and Methods Since the Previous Valuation

The application of Internal Revenue Code Section 415 limits to projected benefits has changed since the previous valuation as of July 1, 2015. Previously projected benefits were limited to the Section 415 limit applicable to the actuarial valuation year. Beginning with the actuarial valuation as of July 1, 2016, projected benefits are limited to a projected Section 415 limit which projects the limit at the actuarial valuation year by the inflation assumption used in the actuarial valuation. There have been no other changes in actuarial valuation assumptions or methods since the previous valuation as of July 1, 2015.

SECTION F
BENEFIT PROVISIONS

BRIEF SUMMARY OF PLAN PROVISIONS AS OF JULY 1, 2016

Current Valuation Plan Provisions

This Section 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.

BRIEF SUMMARY OF PLAN PROVISIONS AS OF JULY 1, 2016
(CONTINUED)

4. Deferred Vested Retirement:

Eligibility:

Ten years of eligible employment.

Benefit:

The Normal Service Retirement benefit is 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:

<u>Year Beginning</u>	<u>Average Annual Increase</u>	<u>Three-Year Average Increase</u>
07/01/1994	3.00%	3.01%
07/01/1995	2.00%	2.86%
07/01/1996	2.00%	2.33%
07/01/1997	3.00%	2.33%
07/01/1998	1.80%	2.27%
07/01/1999	1.26%	2.02%
07/01/2000	2.00%	1.69%
07/01/2001	1.81%	1.69%
07/01/2002	1.73%	1.85%
07/01/2003	0.00%	1.18%
07/01/2004	0.00%	0.58%
07/01/2005	4.00%	1.33%
07/01/2006	4.00%	2.67%
07/01/2007	4.00%	4.00%
07/01/2008	4.00%	4.00%
07/01/2009	5.00%	4.33%
07/01/2010	5.00%	4.67%
07/01/2011	2.00%	4.00%
07/01/2012	2.00%	3.00%
07/01/2013	3.00%	2.33%
07/01/2014	3.00%	2.67%
07/01/2015	3.00%	3.00%
07/01/2016	2.00%	2.67%

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

BRIEF SUMMARY OF PLAN PROVISIONS AS OF JULY 1, 2016
(CONTINUED)

5. Pre-Retirement Death Benefits:

(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. Normal and Optional Forms of Payment:

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.

BRIEF SUMMARY OF PLAN PROVISIONS AS OF JULY 1, 2016
(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%

Changes in Plan Provisions Since the Previous Valuation

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

SECTION G

GLOSSARY OF TERMS

GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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