

West Virginia Teachers' Retirement System

Actuarial Valuation As of July 1, 2015

March 2016



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West Virginia Consolidated Public Retirement Board
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Retirement Board Members:

We respectfully present our report on the actuarial valuation of the West Virginia Teachers' Retirement System (TRS) as of July 1, 2015. This valuation presents the liabilities of the plan as of the valuation date and the projected Employer contribution for fiscal year 2017.

Some key highlights are:

- The valuation was prepared based on an assumed interest rate of 7.5%.
- Based on the valuation results, the State contribution to TRS for fiscal year 2017 is \$413,976,000. The State appropriation needed for fiscal year 2017 for the Teachers' Retirement Plans (TRS and TDC) under the School Aid Formula is \$388,098,000.
- The funded percentage of plan assets to the actuarial accrued liability at the valuation date is 66%, compared to 66% for the prior year. The funded percentage is not based on the cost of settling the benefit obligations of TRS (e.g., through purchase of annuities from an insurer) but it is appropriate for assessing the need for, and the amount of, future contributions.

This report contains supporting data and background information pertaining to the development of costs and related liabilities of the plan. The valuation is based on membership data as of June 30, 2015 maintained by the West Virginia Consolidated Public Retirement Board and financial information received from the West Virginia Investment Management Board.

This report presents fairly the actuarial position of the West Virginia Teachers' Retirement System (TRS) as of July 1, 2015 in accordance with generally accepted actuarial principles applied on a basis consistent with that of the preceding valuation. In our opinion, the assumptions used in preparing the liabilities and costs are individually reasonable in respect to TRS experience and represent our best estimate of anticipated experience under TRS.

The assumptions were developed in accordance with the guidance set forth in the various ASOP's, including ASOP 27 and 35. In particular, the mortality assumptions were developed in accordance with the mandate that an appropriate margin for future improvement in mortality beyond the measurement date be included.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this report.

The valuation results are based on liabilities used for funding purposes only. They do not reflect any changes under GASB 67 and 68, which are effective for fiscal years beginning after June 15, 2013, and June 15, 2014, respectively. The changes made under the new GASB standards only affect liabilities used for financial statement accounting disclosure purposes, which are provided in the separate GASB reports.

Use of this report for any other purpose may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask us to review any statement you wish to make on the results contained in this report. We will not accept any liability for any such statement made without prior review by us.

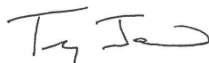
We are Fellows of the Society of Actuaries and Members of the American Academy of Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about it.

Respectfully submitted,

Buck Consultants, LLC



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Section 1 – Summary of Valuation

This report presents the results of the July 1, 2015 actuarial valuation of the West Virginia Teachers' Retirement System and includes the projected employer contribution requirement for FY 2017. A summary of the plan features, a summary of the method, factors and assumptions, and supplementary membership tables used in the valuation are also included.

Valuation Results

The West Virginia Teachers' Retirement System (TRS) is a defined benefit plan covering education employees hired prior to July 1, 1991, or hired on and after July 1, 2005, and prior Teachers' Defined Contribution Plan (TDC) members who elected to transfer from TDC to TRS effective July 1, 2008 or August 1, 2008. The plan provides unreduced monthly benefits to members upon retirement after 35 years of service, or at age 60 after completing 5 years of service. The plan also provides reduced early retirement benefits, benefits in the event of disability or death while active, and deferred benefits to members who terminate prior to retirement, providing plan eligibility conditions are met.

The plan is funded through member contributions of 6% of payroll and employer contributions sufficient to provide for any remaining normal cost (after member contributions are accounted for) and to amortize the unfunded liability as a level-dollar amount starting from FY 2009.

The major purpose of this valuation is to determine the amount of appropriation needed for FY 2017 for West Virginia's Teachers Retirement Plans under the School Aid Formula (SAF), which is determined to be \$388,098,000. Two components of the SAF determination are calculated in the valuation process: the contributions required from the State for TRS, and a projection of the State's contributions to TDC, both for the FY 2017.

The State's contribution to TRS is based on an actuarial valuation of the provisions of the State code and the participant data, in consideration of the assets held in trust for TRS. The details of the TRS contribution for FY 2017 are shown in Table 1.

The State's TRS contribution for FY 2017, assuming a mid-year payment, consists of three separate components:

- The State share of the normal cost,
- The amount needed to fund the unfunded actuarial accrued liability, net of the liability for recent benefit changes, over a 40-year period which began in 1994 (as required by Section 18-9A-6a of the State code), and
- The amount required to separately amortize the liability for recent benefit changes. For FY 2017, there are no separate amortizations.

The total State TRS contribution on this basis is \$413,976,000.

Starting with FY 2009, the annual amortization payment toward the unfunded liability is determined as a level-dollar amount that is amortized over a 40-year period from July 1, 1994. In prior years, the amortization was determined as a level percentage of the projected total education payroll. The total amount contributed to the plan from FY 2009 forward will fund the normal cost plus interest and principal on the unfunded liability, fully amortizing the unfunded liability by the end of FY 2034.

Table 2 presents the development of the School Aid Formula, separately identifying the TRS contribution based on the original 40-year amortization period, any special payments toward the additional unfunded due to recent plan improvements, and other specific components. Detailed projections of the balance of the 40-year funding program under the level-dollar amortization schedule, net of any separately funded improvements, are shown in Tables 3 and 4.

The projected TDC contribution for FY 2017 for the School Aid Formula is based on projected payroll for that participant population. The split of both the TRS and the TDC contributions is based on information

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provided by the state Education Department. The projected fire insurance premium tax shown in Table 2 was provided by the Department of Administration.

Comments on Valuation Results

Table 1 presents the development of the valuation results as of July 1, 2015 and, for comparison purposes, July 1, 2014. Based on the prior year's projections, the expected unfunded actuarial accrued liability as of July 1, 2015 was \$3.275 billion. The actual unfunded liability at the valuation date is \$3.508 billion, an increase of \$0.233 billion.

The increase in the unfunded liability was primarily due to the following:

- The return on assets for the year ending June 30, 2015 was approximately 3.8%. This return was well below the prior year's valuation assumption of 7.50% and increased the unfunded liability by approximately \$190 million.
- Contributions less than expected increased the unfunded liability by approximately \$12 million.
- The combined impact of turnover, mortality, and retirement experience increased the unfunded liability by approximately \$31 million.

Tables 3 and 4 present projections of the unfunded accrued liability, net of any separately funded liability, to June 30, 2034. Table 3 illustrates the expected pattern of change in the unfunded liability over the remaining 20-year period. The unfunded liability is expected to decrease steadily to zero at the end of the period. Table 4 presents the expected funding progress toward the unfunded actuarial accrued liability based on the funding policy. This table illustrates the expected dollar amount of change in this component of the unfunded liability from year to year.

Table 5 presents a cash flow projection of expected asset balances, contributions, disbursements, and earnings over the period to FY 2034.

The valuation results were determined using an interest rate of 7.5% with an underlying inflation assumption of 3.0%.

Plan Membership

A summary of plan membership, with a comparison to the prior year, follows:

	July 1, 2015	July 1, 2014
Actives	35,788	35,724
Retirees & Beneficiaries	34,738	34,000
Terminated Vested	1,707	1,643
Terminated Non-Vested	2,891	2,506
Total	<u>75,124</u>	<u>73,873</u>

Table 8 presents a reconciliation of plan membership during the year. Table 9 presents detailed information on the categories of plan membership.

Tables 10(a) and 10(b) present the number and total annual compensation of actives, separately for Teachers and Non-Teachers (including State), by 5-year age and service groups as of July 1, 2015.

Table 11 presents the number and average monthly benefits of retirees and beneficiaries included in the valuation distributed by 5-year age groups. Table 12 shows a similar distribution for terminated vested participants entitled to deferred benefits.

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Table 1
Development of Valuation Results
 (000's omitted)

Valuation Date	July 1, 2015	July 1, 2014
1. Present Value of Future Benefits		
a. Active	\$ 4,743,343	\$ 4,798,953
b. Inactive - Retirees	6,448,659	6,125,857
- Disabled Retirees	214,159	215,486
- Beneficiaries	224,200	216,893
- Vested Terminated	77,730	83,285
- Non-Vested Terminated	11,597	10,185
c. Total	\$ 11,719,688	\$ 11,450,659
2. Actuarial Accrued Liability	\$ 10,310,652	\$ 10,098,693
3. Assets (Market Value)	6,803,089	6,682,093
4. Unfunded Actuarial Accrued Liability (UAL)	\$ 3,507,563	\$ 3,416,600
5. Annual Normal Cost Rate: Type 1 (Pre 7/1/1991 Group)		
a. Present Value of Future Normal Costs	\$ 102,562	\$ 128,094
b. Present Value of Future Pay	\$ 1,011,244	\$ 1,260,917
c. Normal Cost Rate as a % of Payroll	10.14%	10.16%
d. Employee share	6.00%	6.00%
e. Employer share	4.14%	4.16%
f. TRS FY 2016 (2015) Normal Cost Payroll	\$ 265,213	\$ 316,189
g. Employer FY 2016 (2015) Normal Cost (BOY)	\$ 10,980	\$ 13,153
h. TRS FY 2017 (2016) Normal Cost Payroll	\$ 227,432	\$ 274,304
i. Employer FY 2017 (2016) Normal Cost (BOY)	\$ 9,416	\$ 11,411
6. Annual Normal Cost Rate: Type 3 (Post 6/30/2005 Group)		
a. Present Value of Future Normal Costs	\$ 1,306,474	\$ 1,223,872
b. Present Value of Future Pay	\$ 12,471,568	\$ 11,672,445
c. Normal Cost Rate as a % of Payroll	10.48%	10.49%
d. Employee share	6.00%	6.00%
e. Employer share	4.48%	4.49%
f. TRS FY 2016 (2015) Normal Cost Payroll	\$ 1,246,058	\$ 1,165,597
g. Employer FY 2016 (2015) Normal Cost (BOY)	\$ 55,823	\$ 52,335
h. TRS FY 2017 (2016) Normal Cost Payroll	\$ 1,339,070	\$ 1,261,421
i. Employer FY 2017 (2016) Normal Cost (BOY)	\$ 59,990	\$ 56,638

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Table 1 (continued)
Development of Valuation Results
(000's omitted)

Valuation Date	July 1, 2015	July 1, 2014
7. Employer Contribution for FY 2016 and FY 2017, (FY 2015 and FY 2016), assumes mid-year contribution:		
a. FY 2016 (2015)	FY 2016	FY 2015
i. TRS and TDC Payroll	\$ 1,649,307	\$ 1,623,963
ii. FY 2016 (2015) TRS Contribution		
A. Normal Cost	69,263	67,899
B. Amortization components:		
- Original UAL over 40 years as a level-dollar amount	339,689	323,239
C. Total	\$ 408,952	\$ 391,138
iii. FY 2016 (2015) Contribution as a % of Payroll	24.80%	24.09%
b. FY 2017 (2016)	FY 2017	FY 2016
i. TRS and TDC Payroll	\$ 1,702,084	\$ 1,675,930
ii. FY 2017 (2016) TRS Contribution		
A. Normal Cost	71,962	70,555
B. Amortization components:		
- Original UAL over 40 years as a level-dollar amount	342,014	317,130
C. Total	\$ 413,976	\$ 387,685
iii. FY 2017 (2016) Contribution as a % of Payroll	24.32%	23.13%
iv. FY 2017 (2016) SAF appropriation ¹	\$ 388,098	\$ 365,012
v. FY 2017 (2016) SAF appropriation as a % of Payroll	22.80%	21.78%

¹ The School Aid Formula retirement allocation includes the amount that the State appropriates for the Teachers Defined Contribution Plan and required payments toward the TRS Unfunded Actuarial Accrued Liabilities. It does NOT include amounts contributed to TRS by nonstate groups or the fire premium tax.

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Table 2

**Development of School Aid Formula Appropriation for Fiscal Year 2017
(000's omitted)**

TRS Contribution for FY 2017	\$ 413,976
+ 7.50% x School Aid Formula (TDC only) ¹	7,659
- 15.0% x County Portion of the Old Group TRS payroll ²	(8,646)
- 7.5% x County Portion of the New Group TRS payroll ³	(25,458)
- Fire Tax Per Code Section 33-3-14(d)	(2,735)
+ State payment equal to TDC forfeitures ⁴	<u>3,302</u>
Subtotal of Standard SAF Appropriation	\$ 388,098
Special Payments for Benefit Improvements under H.B. 3145	<u>-</u>
Total FY 2017 SAF Appropriation	\$ 388,098

¹ School Aid Formula for TDC only is 74.17% of FY 2017 TDC pay for County employees plus FY 2017 TDC pay for State employees = 74.17% x \$129,519 + \$6,062 = 102,126.

² County portion of the Old Group TRS payroll is 25.83% of FY 2017 TRS pay for County employees = 25.83% x \$223,152 = \$57,640.

³ County portion of the New Group TRS payroll is 25.83% of FY 2017 TRS pay for County employees = 25.83% x \$1,314,106 = \$339,434.

⁴ Actual amount to be released from the TDC suspense account at 6/30/2015 per Code Section 18-7A-18a(b).

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Table 3
Projection of Unfunded Accrued Liability and Annual Contributions
 (000's omitted)

FY Ending 6/30	Unfunded AAL BOY ¹	Employer Normal Cost (MOY) ²		Projected Payroll			Total Type 1 Employer Contribution (MOY) ³		Total Type 3 Employer Contribution (MOY)	
		Type 1	Type 3	Type 1 TRS	Type 3 TRS	TRS+TDC	% of Payroll	Amount	% of Payroll	Amount
2016	\$ 3,507,563	\$ 11,831	\$ 58,724	\$ 265,213	\$ 1,246,058	\$ 1,649,307	19.95%	\$ 328,961	3.56%	\$ 58,724
2017	3,441,823	9,763	62,199	227,432	1,339,070	1,702,084	20.67%	351,777	3.65%	62,199
2018	3,345,352	8,413	66,328	195,985	1,427,939	1,756,551	19.95%	350,427	3.78%	66,328
2019	3,241,646	7,127	70,486	166,031	1,517,469	1,812,761	19.26%	349,141	3.89%	70,486
2020	3,130,162	5,958	74,612	138,781	1,606,291	1,870,769	18.60%	347,972	3.99%	74,612
2021	3,010,316	4,882	78,755	113,737	1,695,481	1,930,634	17.97%	346,896	4.08%	78,755
2022	2,881,482	3,959	82,836	92,226	1,783,348	1,992,414	17.36%	345,973	4.16%	82,836
2023	2,742,985	3,159	86,895	73,601	1,870,744	2,056,171	16.79%	345,173	4.23%	86,895
2024	2,594,101	2,489	90,921	58,000	1,957,407	2,121,969	16.24%	344,503	4.28%	90,921
2025	2,434,051	1,935	94,940	45,070	2,043,932	2,189,872	15.71%	343,949	4.34%	94,940
2026	2,261,997	1,481	98,962	34,497	2,130,510	2,259,948	15.20%	343,495	4.38%	98,962
2027	2,077,039	1,115	103,007	25,971	2,217,611	2,332,266	14.71%	343,129	4.42%	103,007
2028	1,878,209	823	107,070	19,173	2,305,070	2,406,899	14.24%	342,837	4.45%	107,070
2029	1,664,467	597	111,186	13,913	2,393,673	2,483,919	13.79%	342,611	4.48%	111,186
2030	1,434,694	427	115,358	9,956	2,483,514	2,563,405	13.36%	342,441	4.50%	115,358
2031	1,187,688	301	119,617	7,007	2,575,208	2,645,434	12.94%	342,315	4.52%	119,617
2032	922,157	210	123,955	4,900	2,668,591	2,730,088	12.54%	342,224	4.54%	123,955
2033	636,711	141	128,402	3,297	2,764,328	2,817,450	12.14%	342,155	4.56%	128,402
2034	329,857	93	132,955	2,171	2,862,344	2,907,609	11.77%	342,107	4.57%	132,955

¹ Net of any separately funded liability for benefit increases.

² Net of member contributions.

³ Net of any amortization amounts for separately funded benefit increases.

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Table 4
Funding Progress of Unfunded Actuarial Accrued Liability Under Current Funding Policy
 (000's omitted)

FY Ending 6/30	Unfunded AAL BOY ¹	Interest on Unfunded at 7.50%	MOY Contribution Toward Unfunded ²	Unfunded Funding Progress ³
2016	\$ 3,507,563	\$ 263,067	\$ 317,130	\$ 65,740
2017	3,441,823	258,137	342,014	96,471
2018	3,345,352	250,901	342,014	103,707
2019	3,241,646	243,123	342,014	111,485
2020	3,130,162	234,762	342,014	119,846
2021	3,010,316	225,774	342,014	128,834
2022	2,881,482	216,111	342,014	138,497
2023	2,742,985	205,724	342,014	148,884
2024	2,594,101	194,558	342,014	160,050
2025	2,434,051	182,554	342,014	172,054
2026	2,261,997	169,650	342,014	184,958
2027	2,077,039	155,778	342,014	198,830
2028	1,878,209	140,866	342,014	213,742
2029	1,664,467	124,835	342,014	229,773
2030	1,434,694	107,602	342,014	247,006
2031	1,187,688	89,077	342,014	265,531
2032	922,157	69,162	342,014	285,446
2033	636,711	47,753	342,014	306,855
2034	329,857	24,739	342,014	329,869

¹ Net of any separately funded liability for benefit increases.

² Net of employer contribution toward normal cost and any separately funded benefit increases.

³ Equals (MOY Contribution) x 1.03682 - (Interest on Unfunded)

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Table 5
Cash Flow Projection FY 2016 Through FY 2034
 (000's omitted)

FY Ending 6/30	Assets		Expected			Assets	
	Beg. of Year		Contributions	Benefits	Earnings	Net Income	End of Year
2016	\$ 6,803,089	\$	478,361	\$ 781,688	\$ 499,063	\$ 195,736	\$ 6,998,825
2017	6,998,825		507,966	793,395	514,402	228,973	7,227,798
2018	7,227,798		514,190	816,118	530,967	229,039	7,456,837
2019	7,456,837		520,637	836,516	547,631	231,752	7,688,589
2020	7,688,589		527,288	855,264	564,567	236,591	7,925,180
2021	7,925,180		534,204	872,282	581,940	243,862	8,169,042
2022	8,169,042		541,343	886,728	599,960	254,575	8,423,617
2023	8,423,617		548,729	898,224	618,902	269,407	8,693,024
2024	8,693,024		556,348	907,262	639,055	288,141	8,981,165
2025	8,981,165		564,229	913,644	660,721	311,306	9,292,471
2026	9,292,471		572,357	918,199	684,201	338,359	9,630,830
2027	9,630,830		580,751	921,617	709,761	368,895	9,999,725
2028	9,999,725		589,362	923,276	737,684	403,770	10,403,495
2029	10,403,495		598,252	923,964	768,269	442,557	10,846,052
2030	10,846,052		607,407	923,356	801,820	485,871	11,331,923
2031	11,331,923		616,865	922,245	838,650	533,270	11,865,193
2032	11,865,193		626,588	920,877	879,053	584,764	12,449,957
2033	12,449,957		636,615	918,977	923,350	640,988	13,090,945
2034	13,090,945		646,933	915,908	971,917	702,942	13,793,887

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Table 6
Valuation Assets as of June 30, 2015
(000's omitted)

	June 30, 2015	June 30, 2014
Assets		
Cash with State Treasurer	\$ 20,329	\$ 5
Investments at Fair Value	6,753,118	6,655,376
Contributions Receivable	25,119	23,063
Participant Loans Receivable	3,389	4,074
Miscellaneous Revenue Receivable	1,134	113
Total Assets	<u>\$ 6,803,089</u>	<u>\$ 6,682,631</u>
Liabilities		
Accrued Expenses and Other Payables	<u>-</u>	<u>538</u>
Net Assets for Pension Benefits	\$ 6,803,089	\$ 6,682,093

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Table 7

Statement of Changes in Net Assets for Benefits For Year ended June 30, 2015
(000's omitted)

Net Assets for Pension Benefits - Beginning of Year	\$	6,682,093
Post Valuation Adjustment		-
Net Assets for Pension Benefits - After Adjustment	\$	6,682,093
Additions:		
Contributions:		
Member Type 1	\$	18,783
Member Type 3		75,835
Employer Type 1		10,713
Employer Type 3		19,553
School Aid Formula		407,753
Make Up Contributions		-
Special Appropriations		-
Voluntary Special Contribution Members		-
Special Contribution Required Employers		-
Contribution Delinquency Fees		8
§33-3-14(d) Fees		2,735
Subtotal	\$	535,380
Investment Income:		
Net Appreciation in Fair Value ¹		255,645
Interest		1,059
Subtotal	\$	256,704
Other Income		52,304
Total	\$	844,388
Deductions and Transfers:		
Benefit Expense	\$	710,702
Refunds of Contributions		7,993
Administrative Expenses		4,432
TDC to TRS Accounts for Transfers		-
Transfers to/(from) other plans		265
Total	\$	723,392
Net Increase	\$	120,996
Net Assets for Pension Benefits - End of Year	\$	6,803,089
Investment Return for Year:		
Valuation purposes (assumes mid-year transactions and offsets investment income by investment and administrative expenses)		3.81%
Per Investment Management Board (time-weighted, excluding administrative expense)		3.96%

¹ Net of Investment Expense

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Table 8
Reconciliation of Plan Participants

	Active	Non-Vested Terms	Vested Terms	Service Retirees	Disabled Retirees	Beneficiaries	Total
Census as of July 1, 2014	35,724	2,506	1,643	29,274	2,218	2,508	73,873
New Entrants	2,687	124	-	-	-	196	3,007
Returned to Active Status	244	(178)	(65)	-	(1)	-	-
Terminated Non-Vested	(579)	579	-	-	-	-	-
Terminated Vested	(291)	-	291	-	-	-	-
Withdrew Contributions	(310)	(128)	(39)	-	-	-	(477)
Retired	(1,560)	-	(107)	1,667	-	-	-
Disabled	(71)	-	(7)	-	78	-	-
Deceased	(49)	(9)	(7)	(935)	(90)	(161)	(1,251)
Certain Period Expired	-	-	-	-	-	(12)	(12)
Adjustments	(7)	(3)	(2)	1	(2)	(3)	(16)
Census as of July 1, 2015	35,788	2,891	1,707	30,007	2,203	2,528	75,124

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Table 9

Summary of Membership

	July 1, 2015 Valuation	July 1, 2014 Valuation
Active Members:		
Teachers	21,474	21,382
Non-Teachers (including State)	14,314	14,342
Total	<u>35,788</u>	<u>35,724</u>
Inactive Members:		
Service Retirees	30,007	29,274
Disabled Retirees	2,203	2,218
Beneficiaries	2,528	2,508
Vested Terminated	1,707	1,643
Non-Vested Terminated	2,891	2,506
Total	<u>39,336</u>	<u>38,419</u>
Total Members	75,124	73,873

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Table 10(a)
Distribution of the Number and Total Annual Compensation of Active Teachers as of July 1, 2015

Attained Age	Years of Credited Service														Total Count / Total Comp		
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over								
	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp			
Under 25	487																487
25 - 29	17,843,353																17,843,353
	2,049	494															2,543
30 - 34	79,390,118	21,225,570															100,615,688
	1,076	1,799	215														3,090
35 - 39	43,192,351	80,320,117	10,591,080														134,103,548
	988	1,148	859	45													3,040
40 - 44	39,832,005	53,408,583	44,104,991	2,513,078													139,858,657
	613	808	758	355	32												2,566
45 - 49	25,747,215	37,654,684	39,528,736	19,741,405	1,970,359												124,642,399
	407	629	525	480	251	148											2,440
50 - 54	17,216,273	30,078,084	27,588,353	27,313,856	14,926,475	8,982,740											126,105,782
	288	421	422	274	307	682	391										2,785
55 - 59	13,008,147	20,283,513	22,186,947	15,827,528	18,868,290	43,080,439	25,636,649										158,891,513
	201	307	324	290	229	418	545	314									2,628
60 - 64	9,403,578	15,404,370	17,307,529	16,502,239	13,789,792	25,943,595	36,354,903	22,074,814									156,780,819
	117	170	186	190	130	186	152	265	110								1,506
65 - 69	6,149,414	8,836,758	10,155,854	10,958,019	7,834,590	11,805,300	10,258,008	18,405,370	8,553,064								92,956,376
	35	45	42	34	12	39	31	26	58								322
70 & over	1,701,097	2,364,180	2,197,805	1,998,990	781,810	2,645,398	2,163,215	1,814,822	4,364,313								20,031,631
	10	8	9	3	4	8	5	4	16								67
Total	480,345	381,974	509,127	228,488	248,320	526,437	303,720	299,153	1,160,832								4,138,395
	6,271	5,829	3,340	1,671	965	1,481	1,124	609	184								21,474
	253,963,897	269,957,832	174,170,421	95,083,604	58,419,635	92,983,909	74,716,496	42,594,159	14,078,209								1,075,968,162

Section 1 – Summary of Valuation

Table 10(b)
Distribution of the Number and Total Annual Compensation of Active Non-Teachers (including State Employees) as of July 1, 2015

Attained Age	Years of Credited Service														Total Count / Total Comp	
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over					Total Count / Total Comp		
	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp	Count / Total Comp			
Under 25	122 2,899,506	1 26,009														123 2,925,515
25 - 29	287 7,642,126	57 1,761,684														344 9,403,809
30 - 34	369 9,627,399	163 5,285,477	19 644,329													551 15,557,204
35 - 39	756 18,214,276	391 11,837,940	113 3,894,182	12 503,676												1,272 34,450,074
40 - 44	718 17,068,268	616 17,668,582	258 8,520,886	59 2,302,490	8 320,715	2 79,146										1,661 45,960,086
45 - 49	681 16,433,284	735 20,087,564	443 13,701,524	167 6,129,083	56 2,445,372	66 2,986,852	5 259,262									2,153 62,042,941
50 - 54	620 14,729,376	777 20,942,068	599 17,968,743	325 11,036,604	107 4,222,266	195 8,786,727	159 7,928,060	31 1,502,523								2,813 87,116,366
55 - 59	501 12,020,744	615 16,842,468	561 16,530,817	458 15,160,998	173 6,625,803	272 11,396,337	181 9,237,232	132 7,027,623	10 442,793							2,903 95,284,814
60 - 64	272 6,412,342	345 9,444,533	328 10,019,398	271 8,994,547	126 4,601,062	193 8,013,115	104 4,796,336	89 4,684,155	36 1,743,534							1,764 58,709,023
65 - 69	81 1,836,683	110 2,680,030	93 2,627,984	75 2,341,621	26 932,907	47 1,990,986	27 1,283,536	27 1,291,138	25 1,490,502							511 16,475,386
70 & over	42 1,021,250	35 1,020,591	38 1,012,116	19 537,686	13 482,047	19 768,831	9 356,376	21 890,560	23 1,288,475							219 7,377,932
Total	4,449 107,905,253	3,845 107,596,946	2,452 74,919,979	1,386 47,006,704	509 19,630,172	794 34,021,994	485 23,860,801	300 15,396,000	94 4,965,304							14,314 435,303,151

Section 1 – Summary of Valuation

Table 11
Distribution of the Number and Average Monthly Benefits of Retired Participants as of July 1, 2015

Current Age	Service Retirees			Disabled Retirees			Beneficiaries			Total		
	Count	Avg. Age	Avg. Mo. Benefit	Count	Avg. Age	Avg. Mo. Benefit	Count	Avg. Age	Avg. Mo. Benefit	Count	Avg. Age	Avg. Mo. Benefit
under 35	-	-	-	-	-	-	14	29	1,399	14	29	1,399
35 - 39	-	-	-	2	38	945	13	37	1,336	15	37	1,284
40 - 44	-	-	-	9	43	554	21	42	681	30	43	643
45 - 49	1	49	1,408	27	48	725	39	47	759	67	47	755
50 - 54	51	54	2,322	114	52	1,063	74	52	960	239	53	1,300
55 - 59	1,482	58	3,009	326	57	1,047	122	57	1,116	1,930	58	2,558
60 - 64	6,179	62	2,592	532	62	1,054	255	62	1,257	6,966	62	2,426
65 - 69	7,796	67	2,197	558	67	959	336	67	1,214	8,690	67	2,079
70 - 74	5,020	72	1,762	384	72	787	349	72	1,039	5,753	72	1,653
75 - 79	3,692	77	1,365	163	77	585	355	77	888	4,210	77	1,294
80 - 84	2,837	82	1,122	44	82	464	378	82	811	3,259	82	1,077
85 - 89	1,907	87	966	29	87	416	357	87	760	2,293	87	927
90 - 94	776	92	871	13	92	384	159	92	661	948	92	829
95 & over	266	97	671	2	95	330	56	97	565	324	97	651
Total	30,007	71	1,916	2,203	66	917	2,528	74	953	34,738	71	1,782
Total Annual Benefits			689,832,551			24,248,361			28,901,307			742,982,219

Section 1 – Summary of Valuation

Table 12
Distribution of the Number and Average Monthly Benefits
of Participants Entitled to Deferred Benefits as of July 1, 2015

Current Age	Count	Deferred Vested	
		Avg. Age	Avg. Mo. Benefit
under 35	142	32	383
35 - 39	125	37	439
40 - 44	123	42	540
45 - 49	170	47	561
50 - 54	363	52	591
55 - 59	489	57	714
60 - 64	247	62	581
65 - 69	41	66	401
70 - 74	5	70	403
75 - 79	2	76	2,718
80 & over	-	-	-
Total	1,707	51	587
Total Annual Benefits			12,023,153

Section 2 – Summary of Plan Provisions

System Name

The State Teachers' Retirement System (TRS)

Effective Date

Originally enacted effective July 1, 1941.

Member

Membership includes any employee hired before July 1991, or on or after July 1, 2005, in the public schools, state institutions of higher education, certain state departments, and the Board of Regents, and members of the Teachers' Defined Contribution Plan (TDC) who elected to transfer at July 1 or August 1, 2008. Other members of TDC or TIAA-CREF are not eligible for TRS.

Final Average Salary

Final Average Salary is the average of the member's 5 highest fiscal years of total earnings from covered employment during the member's last 15 years of service.

Contributions

Member Contributions

Members contribute 6.0% of their pay to the retirement system.

Employer Contributions – State

- 15.0% of the payroll of State-employed members,
- 15.0% of School Aid Formula (SAF) covered payroll of county-employed members,
- 7.5% of SAF-covered payroll of members of the TDC Plan,
- a certain percentage of fire insurance premiums paid by state residents, and
- under Code Section 18-9-A-6a, beginning in fiscal year 1996, an amount determined by the State Actuary as being needed to eliminate the TRS Unfunded Liability within 40 years of June 30, 1994.

Employer Contributions – County

15.0% of the payroll of TRS members hired before July 1, 1991 and 7.5% of the payroll for TRS members hired on or after July 1, 2005, and prior TDC members who transferred into TRS at July 1, 2008 or August 1, 2008, who are employed by county boards of education, which is not covered under the School Aid Formula.

Service

Credited Service

Credited Service is granted for each day the member performs work and contributes to the System. At most one year of Credited Service may be earned in any one school year. Credited Service may be granted under certain guidelines for other State employment, for military service, and for out-of-state teaching service.

Contributory Service

Service credited for years in which a member contributes to the retirement system. Contributory service is counted for both eligibility and benefit determination.

Military Service

Active service in the U.S. military up to 25% of the amount of a member's Contributory Service (but not more than 10 years) will be counted for both eligibility and benefit determination under the retirement system.

Section 2 – Summary of Plan Provisions

Purchased Service

Service in parochial school or with other states' teacher retirement systems may count for benefits (but not eligibility), provided that the member pays TRS double the amount contributed during the first year of employment times the number of years credited plus interest, and cashes out his rights to any future benefits under his prior retirement system.

Unused Leave

A retiring member may choose to receive pension credited service for days of sick or annual leave unused at the time of retirement. Credited Service is granted at the rate of twice the actual number of unused days.

Service Retirement

Eligibility

A member may retire with an unreduced pension (1) at any age with 35 years of Credited Service, or (2) at age 60 with 5 years of Credited Service. A member may retire with 30 years of Credited Service at any age, with the pension reduced actuarially if the member retires before age 55.

Amount

The normal form of benefit is a single life annuity paid monthly, in an amount equal to 2.0% of Final Average Salary times years of Credited Service. Other forms of benefit may be elected, subject to actuarial reduction, including a cash refund annuity, 50% or 100% joint and survivor annuities, and a 10-year certain and life annuity.

Disability Retirement

Eligibility

A member may be eligible to receive a disability retirement benefit after completing 10 years of Credited Service, if the member is disabled for 6 months, unable to perform his regular occupation and the Retirement Board expects the disability to be permanent.

Amount

An annual disability benefit amount, payable monthly as a cash refund annuity, is equal to 2.0% of the member's Final Average Salary times the total years of Credited Service to date of disability.

Deferred Vested Benefit

Eligibility

A member leaving employment with 5 years of Contributory Service may elect to receive either a refund of contributions or a deferred pension commencing at age 62. If a member has 20 years of Contributory Service, the deferral age is age 60.

Amount

An annuity defined as described under "Service Retirement."

Pre-Retirement Death Benefits

Eligibility

The surviving spouse of a deceased member who had attained age 50 and completed 25 years of Credited Service is eligible for the Surviving Spouse Benefit. If a member dies prior to attaining age 50 or completing 25 years of Credited Service a Lump Sum Death Benefit is payable to the beneficiary.

Section 2 – Summary of Plan Provisions

Amount

To the Surviving Spouse

The surviving spouse receives an annuity payable as if the member had retired on the date of death with a 100% joint and survivor pension.

Lump Sum Death Benefit

The sum of the accumulated member contributions with interest and accumulated member contributions without interest is paid to the member's beneficiary or estate.

Refund of Contributions

Eligibility

A member who leaves employment and is not eligible for any other benefit will receive a refund of his contributions to the retirement system.

Amount

A lump sum of the member's accumulated contributions, with compound interest computed on any contributed amount from the end of the fiscal year in which contributed to the date of distribution of the lump sum (but in no case beyond 5 years after the end of the fiscal year during which the member left service). For purposes of this benefit, interest is computed at a 4.0% annual rate.

Post-Retirement Cost-of-Living Adjustments

Ad hoc cost-of-living increases in pensions are periodically granted by the State Legislature. However, the retirement system makes no automatic provision for such increases.

- Effective July 1, 2001 retirees age 65 and over who were retired for at least 5 years received a percentage increase in benefits as follows:
 - Eligible retirees age 65 to age 70 received a 5% increase, and
 - Eligible retirees over age 70 received a 10% increase.

However, if the retiree originally retired under an early retirement window the percentage increase was limited to 3%.

- Effective July 1, 2006, retirees age 70 and over who were retired for at least 5 years received a 3% increase in retirement benefits.
- Effective July 1, 2008, all retirees and applicable beneficiaries thereof who retired with 20 or more years of service and are receiving a primary retiree pension of \$600 or less per month received a thirteenth check single payment of \$600.
- Effective July 1, 2011, a select group of retirees received a thirteenth check single payment of \$1,200.

Section 3 – Actuarial Assumptions and Methods

Valuation Date

July 1, 2015

Funding Method

The valuation is prepared under the Entry Age Normal Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry is based on adjusted date of hire (i.e. valuation date minus known past service).

Basis for Assumptions

Experience studies are performed at least once in every 5-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board on the basis of an experience study covering the period from July 1, 2005, to June 30, 2010. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

Interest Rate and Expenses

The valuation interest assumption is 7.5 % per annum, with no loading for system expenses.

Salary Scales

The salary scales are shown in the Appendix. Salary scales include an assumed underlying inflation rate of 3.00%. The ranges of projected salary increases are as follows:

- Teachers 3.75% to 5.25% per year
- Non-Teachers 3.40% to 6.50% per year

Pre-Retirement Mortality

RP-2000 Non-Annuitant tables

Post-Retirement Mortality

The post-retirement mortality tables are as follows:

- Healthy RP-2000 Healthy Annuitant tables, projected to 2020 with Scale AA
- Disabled RP-2000 Disabled Annuitant tables, projected to 2020 with Scale AA, set back 2 years for males, and set back 1 year for females

Withdrawal from Service

Withdrawal rates are shown in the Appendix. Withdrawal rates are assumed to cease upon eligibility for retirement. All withdrawal is assumed to result in refund of contributions if non-vested or a deferred annuity if vested.

Disablement Rates

Disablement rates are shown in the Appendix.

Retirement Rates

Retirement rates are shown in the Appendix.

Section 3 – Actuarial Assumptions and Methods

Family Composition

It is assumed that 85% of males and 80% of females are married, with husbands 3 years older than wives. Remarriage rates are not used.

Accrual of Future Service

It is assumed that all active members will accrue 1 year of service for each future year of employment.

Noncontributory Service Loadings

The load factor assumptions for non-contributory service (military, parochial or out-of-state teaching, transferred PERS service, and unused sick leave) are as follows:

- Male – Teachers 7.50% load
- Male – Non-Teachers 4.00% load
- Female – Teachers 4.00% load
- Female – Non-Teachers 2.75% load

System Contributions

Both employee and employer contributions to the System are assumed to be paid in the middle of the year.

Appendix – Detailed Assumptions

Salary Scales

Age	Teachers	Non-Teachers and State	Age	Teachers	Non-Teachers and State
19	5.250%	6.500%	45	4.050%	4.850%
20	5.250	6.500	46	4.010	4.800
21	5.200	6.500	47	3.970	4.750
22	5.150	6.375	48	3.930	4.650
23	5.100	6.250	49	3.890	4.550
24	5.050	6.125	50	3.850	4.400
25	5.000	6.000	51	3.850	4.234
26	4.950	5.900	52	3.850	4.178
27	4.900	5.800	53	3.850	4.122
28	4.850	5.700	54	3.850	4.066
29	4.800	5.600	55	3.850	4.010
30	4.750	5.500	56	3.850	3.954
31	4.700	5.475	57	3.850	3.898
32	4.650	5.450	58	3.850	3.842
33	4.600	5.425	59	3.850	3.785
34	4.550	5.400	60	3.850	3.730
35	4.500	5.375	61	3.850	3.674
36	4.450	5.350	62	3.850	3.618
37	4.400	5.325	63	3.850	3.562
38	4.350	5.300	64	3.850	3.506
39	4.300	5.275	65	3.850	3.400
40	4.250	5.250	66	3.830	3.400
41	4.210	5.200	67	3.810	3.400
42	4.170	5.100	68	3.790	3.400
43	4.130	5.000	69	3.770	3.400
44	4.090	4.900	70	3.750	3.400

Appendix – Detailed Assumptions

Withdrawal Rates for Teachers (less than 1 year)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.30000	0.30000	36	0.23600	0.23600	53	0.16800	0.16800
20	0.30000	0.30000	37	0.23200	0.23200	54	0.16400	0.16400
21	0.29600	0.29600	38	0.22800	0.22800	55	0.16000	0.16000
22	0.29200	0.29200	39	0.22400	0.22400	56	0.15600	0.15600
23	0.28800	0.28800	40	0.22000	0.22000	57	0.15200	0.15200
24	0.28400	0.28400	41	0.21600	0.21600	58	0.14800	0.14800
25	0.28000	0.28000	42	0.21200	0.21200	59	0.14400	0.14400
26	0.27600	0.27600	43	0.20800	0.20800	60	0.14000	0.14000
27	0.27200	0.27200	44	0.20400	0.20400	61	0.14000	0.14000
28	0.26800	0.26800	45	0.20000	0.20000	62	0.14000	0.14000
29	0.26400	0.26400	46	0.19600	0.19600	63	0.14000	0.14000
30	0.26000	0.26000	47	0.19200	0.19200	64	0.14000	0.14000
31	0.25600	0.25600	48	0.18800	0.18800	65	0.14000	0.14000
32	0.25200	0.25200	49	0.18400	0.18400	66	0.14000	0.14000
33	0.24800	0.24800	50	0.18000	0.18000	67	0.14000	0.14000
34	0.24400	0.24400	51	0.17600	0.17600	68	0.14000	0.14000
35	0.24000	0.24000	52	0.17200	0.17200	69	0.14000	0.14000

Withdrawal Rates for Teachers (1 to 2 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.14300	0.13000	36	0.10560	0.09600	53	0.06600	0.06000
20	0.14300	0.13000	37	0.10120	0.09200	54	0.06600	0.06000
21	0.14080	0.12800	38	0.09680	0.08800	55	0.06600	0.06000
22	0.13860	0.12600	39	0.09240	0.08400	56	0.06380	0.05800
23	0.13640	0.12400	40	0.08800	0.08000	57	0.06160	0.05600
24	0.13420	0.12200	41	0.08580	0.07800	58	0.05940	0.05400
25	0.13200	0.12000	42	0.08360	0.07600	59	0.05720	0.05200
26	0.12980	0.11800	43	0.08140	0.07400	60	0.05500	0.05000
27	0.12760	0.11600	44	0.07920	0.07200	61	0.05500	0.05000
28	0.12540	0.11400	45	0.07700	0.07000	62	0.05500	0.05000
29	0.12320	0.11200	46	0.07480	0.06800	63	0.05500	0.05000
30	0.12100	0.11000	47	0.07260	0.06600	64	0.05500	0.05000
31	0.11880	0.10800	48	0.07040	0.06400	65	0.05500	0.05000
32	0.11660	0.10600	49	0.06820	0.06200	66	0.05500	0.05000
33	0.11440	0.10400	50	0.06600	0.06000	67	0.05500	0.05000
34	0.11220	0.10200	51	0.06600	0.06000	68	0.05500	0.05000
35	0.11000	0.10000	52	0.06600	0.06000	69	0.05500	0.05000

Appendix – Detailed Assumptions

Withdrawal Rates for Teachers (2 to 3 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.10000	0.10000	36	0.06550	0.06200	53	0.05400	0.04000
20	0.10000	0.10000	37	0.06500	0.06000	54	0.05300	0.04000
21	0.10000	0.10000	38	0.06450	0.05800	55	0.05200	0.04000
22	0.10000	0.10000	39	0.06400	0.05600	56	0.05100	0.04000
23	0.09400	0.09600	40	0.06350	0.05400	57	0.05000	0.04000
24	0.08800	0.09200	41	0.06300	0.05200	58	0.05000	0.04000
25	0.08200	0.08800	42	0.06250	0.05000	59	0.05000	0.04000
26	0.07600	0.08400	43	0.06200	0.04800	60	0.05000	0.04000
27	0.07000	0.08000	44	0.06150	0.04600	61	0.05000	0.04000
28	0.06950	0.07800	45	0.06100	0.04400	62	0.05000	0.04000
29	0.06900	0.07600	46	0.06050	0.04200	63	0.05000	0.04000
30	0.06850	0.07400	47	0.06000	0.04000	64	0.05000	0.04000
31	0.06800	0.07200	48	0.05900	0.04000	65	0.05000	0.04000
32	0.06750	0.07000	49	0.05800	0.04000	66	0.05000	0.04000
33	0.06700	0.06800	50	0.05700	0.04000	67	0.05000	0.04000
34	0.06650	0.06600	51	0.05600	0.04000	68	0.05000	0.04000
35	0.06600	0.06400	52	0.05500	0.04000	69	0.05000	0.04000

Withdrawal Rates for Teachers (3 to 4 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.08000	0.08000	36	0.05200	0.03680	53	0.03000	0.03000
20	0.08000	0.08000	37	0.04900	0.03600	54	0.03000	0.03000
21	0.08000	0.08000	38	0.04600	0.03600	55	0.03000	0.03000
22	0.08000	0.08000	39	0.04300	0.03600	56	0.03000	0.03000
23	0.08000	0.07600	40	0.04000	0.03600	57	0.03000	0.03000
24	0.08000	0.07200	41	0.03800	0.03600	58	0.03000	0.03000
25	0.08000	0.06800	42	0.03600	0.03600	59	0.03000	0.03000
26	0.07600	0.06400	43	0.03400	0.03400	60	0.03000	0.03000
27	0.07200	0.06000	44	0.03200	0.03200	61	0.03000	0.03000
28	0.06800	0.05600	45	0.03000	0.03000	62	0.03000	0.03000
29	0.06400	0.05200	46	0.03000	0.03000	63	0.03000	0.03000
30	0.06000	0.04800	47	0.03000	0.03000	64	0.03000	0.03000
31	0.05900	0.04400	48	0.03000	0.03000	65	0.03000	0.03000
32	0.05800	0.04000	49	0.03000	0.03000	66	0.03000	0.03000
33	0.05700	0.03920	50	0.03000	0.03000	67	0.03000	0.03000
34	0.05600	0.03840	51	0.03000	0.03000	68	0.03000	0.03000
35	0.05500	0.03760	52	0.03000	0.03000	69	0.03000	0.03000

Appendix – Detailed Assumptions

Withdrawal Rates for Teachers (4 to 5 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.06000	0.04000	36	0.03200	0.02800	53	0.01500	0.01500
20	0.06000	0.04000	37	0.02900	0.02667	54	0.01500	0.01500
21	0.06000	0.04000	38	0.02600	0.02533	55	0.01500	0.01500
22	0.06000	0.04000	39	0.02300	0.02400	56	0.01500	0.01500
23	0.06000	0.04000	40	0.02000	0.02267	57	0.01500	0.01500
24	0.06000	0.04000	41	0.02000	0.02133	58	0.01500	0.01500
25	0.06000	0.04000	42	0.02000	0.02000	59	0.01500	0.01500
26	0.05600	0.04000	43	0.02000	0.02000	60	0.01500	0.01500
27	0.05200	0.04000	44	0.02000	0.02000	61	0.01500	0.01500
28	0.04800	0.03867	45	0.02000	0.02000	62	0.01500	0.01500
29	0.04400	0.03733	46	0.01900	0.01900	63	0.01500	0.01500
30	0.04000	0.03600	47	0.01800	0.01800	64	0.01500	0.01500
31	0.03900	0.03467	48	0.01700	0.01700	65	0.01500	0.01500
32	0.03800	0.03333	49	0.01600	0.01600	66	0.01500	0.01500
33	0.03700	0.03200	50	0.01500	0.01500	67	0.01500	0.01500
34	0.03600	0.03067	51	0.01500	0.01500	68	0.01500	0.01500
35	0.03500	0.02933	52	0.01500	0.01500	69	0.01500	0.01500

Withdrawal Rates for Teachers (greater than 5 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.03200	0.03200	36	0.02141	0.01920	53	0.01440	0.01040
20	0.03200	0.03200	37	0.02082	0.01840	54	0.01520	0.01120
21	0.03120	0.03120	38	0.02022	0.01760	55	0.01600	0.01200
22	0.03040	0.03040	39	0.01963	0.01680	56	0.01600	0.01200
23	0.02960	0.02960	40	0.01904	0.01600	57	0.01600	0.01200
24	0.02880	0.02880	41	0.01843	0.01520	58	0.01600	0.01200
25	0.02800	0.02800	42	0.01782	0.01440	59	0.01600	0.01200
26	0.02720	0.02720	43	0.01722	0.01360	60	0.01600	0.01200
27	0.02640	0.02640	44	0.01661	0.01280	61	0.01600	0.01200
28	0.02560	0.02560	45	0.01600	0.01200	62	0.01600	0.01200
29	0.02480	0.02480	46	0.01520	0.01120	63	0.01600	0.01200
30	0.02400	0.02400	47	0.01440	0.01040	64	0.01600	0.01200
31	0.02360	0.02320	48	0.01360	0.00960	65	0.01600	0.01200
32	0.02320	0.02240	49	0.01280	0.00880	66	0.01600	0.01200
33	0.02280	0.02160	50	0.01200	0.00800	67	0.01600	0.01200
34	0.02240	0.02080	51	0.01280	0.00880	68	0.01600	0.01200
35	0.02200	0.02000	52	0.01360	0.00960	69	0.01600	0.01200

Appendix – Detailed Assumptions

Withdrawal Rates for Non-Teachers and State (less than 1 year)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.22500	0.22500	36	0.17700	0.17700	53	0.12600	0.12600
20	0.22500	0.22500	37	0.17400	0.17400	54	0.12300	0.12300
21	0.22200	0.22200	38	0.17100	0.17100	55	0.12000	0.12000
22	0.21900	0.21900	39	0.16800	0.16800	56	0.11700	0.11700
23	0.21600	0.21600	40	0.16500	0.16500	57	0.11400	0.11400
24	0.21300	0.21300	41	0.16200	0.16200	58	0.11100	0.11100
25	0.21000	0.21000	42	0.15900	0.15900	59	0.10800	0.10800
26	0.20700	0.20700	43	0.15600	0.15600	60	0.10500	0.10500
27	0.20400	0.20400	44	0.15300	0.15300	61	0.10500	0.10500
28	0.20100	0.20100	45	0.15000	0.15000	62	0.10500	0.10500
29	0.19800	0.19800	46	0.14700	0.14700	63	0.10500	0.10500
30	0.19500	0.19500	47	0.14400	0.14400	64	0.10500	0.10500
31	0.19200	0.19200	48	0.14100	0.14100	65	0.10500	0.10500
32	0.18900	0.18900	49	0.13800	0.13800	66	0.10500	0.10500
33	0.18600	0.18600	50	0.13500	0.13500	67	0.10500	0.10500
34	0.18300	0.18300	51	0.13200	0.13200	68	0.10500	0.10500
35	0.18000	0.18000	52	0.12900	0.12900	69	0.10500	0.10500

Withdrawal Rates for Non-Teachers and State (1 to 2 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.13000	0.11700	36	0.09600	0.08640	53	0.06000	0.05400
20	0.13000	0.11700	37	0.09200	0.08280	54	0.06000	0.05400
21	0.12800	0.11520	38	0.08800	0.07920	55	0.06000	0.05400
22	0.12600	0.11340	39	0.08400	0.07560	56	0.05800	0.05220
23	0.12400	0.11160	40	0.08000	0.07200	57	0.05600	0.05040
24	0.12200	0.10980	41	0.07800	0.07020	58	0.05400	0.04860
25	0.12000	0.10800	42	0.07600	0.06840	59	0.05200	0.04680
26	0.11800	0.10620	43	0.07400	0.06660	60	0.05000	0.04500
27	0.11600	0.10440	44	0.07200	0.06480	61	0.05000	0.04500
28	0.11400	0.10260	45	0.07000	0.06300	62	0.05000	0.04500
29	0.11200	0.10080	46	0.06800	0.06120	63	0.05000	0.04500
30	0.11000	0.09900	47	0.06600	0.05940	64	0.05000	0.04500
31	0.10800	0.09720	48	0.06400	0.05760	65	0.05000	0.04500
32	0.10600	0.09540	49	0.06200	0.05580	66	0.05000	0.04500
33	0.10400	0.09360	50	0.06000	0.05400	67	0.05000	0.04500
34	0.10200	0.09180	51	0.06000	0.05400	68	0.05000	0.04500
35	0.10000	0.09000	52	0.06000	0.05400	69	0.05000	0.04500

Appendix – Detailed Assumptions

Withdrawal Rates for Non-Teachers and State (2 to 3 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.10000	0.08000	36	0.06700	0.05360	53	0.04000	0.03200
20	0.10000	0.08000	37	0.06400	0.05120	54	0.04000	0.03200
21	0.10000	0.08000	38	0.06100	0.04880	55	0.04000	0.03200
22	0.10000	0.08000	39	0.05800	0.04640	56	0.04000	0.03200
23	0.10000	0.08000	40	0.05500	0.04400	57	0.04000	0.03200
24	0.10000	0.08000	41	0.05200	0.04160	58	0.04000	0.03200
25	0.10000	0.08000	42	0.04900	0.03920	59	0.04000	0.03200
26	0.09700	0.07760	43	0.04600	0.03680	60	0.04000	0.03200
27	0.09400	0.07520	44	0.04300	0.03440	61	0.04000	0.03200
28	0.09100	0.07280	45	0.04000	0.03200	62	0.04000	0.03200
29	0.08800	0.07040	46	0.04000	0.03200	63	0.04000	0.03200
30	0.08500	0.06800	47	0.04000	0.03200	64	0.04000	0.03200
31	0.08200	0.06560	48	0.04000	0.03200	65	0.04000	0.03200
32	0.07900	0.06320	49	0.04000	0.03200	66	0.04000	0.03200
33	0.07600	0.06080	50	0.04000	0.03200	67	0.04000	0.03200
34	0.07300	0.05840	51	0.04000	0.03200	68	0.04000	0.03200
35	0.07000	0.05600	52	0.04000	0.03200	69	0.04000	0.03200

Withdrawal Rates for Non-Teachers and State (3 to 4 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.08000	0.07200	36	0.05200	0.04680	53	0.03000	0.02700
20	0.08000	0.07200	37	0.04900	0.04410	54	0.03000	0.02700
21	0.08000	0.07200	38	0.04600	0.04140	55	0.03000	0.02700
22	0.08000	0.07200	39	0.04300	0.03870	56	0.03000	0.02700
23	0.08000	0.07200	40	0.04000	0.03600	57	0.03000	0.02700
24	0.08000	0.07200	41	0.03800	0.03420	58	0.03000	0.02700
25	0.08000	0.07200	42	0.03600	0.03240	59	0.03000	0.02700
26	0.07600	0.06840	43	0.03400	0.03060	60	0.03000	0.02700
27	0.07200	0.06480	44	0.03200	0.02880	61	0.03000	0.02700
28	0.06800	0.06120	45	0.03000	0.02700	62	0.03000	0.02700
29	0.06400	0.05760	46	0.03000	0.02700	63	0.03000	0.02700
30	0.06000	0.05400	47	0.03000	0.02700	64	0.03000	0.02700
31	0.05900	0.05310	48	0.03000	0.02700	65	0.03000	0.02700
32	0.05800	0.05220	49	0.03000	0.02700	66	0.03000	0.02700
33	0.05700	0.05130	50	0.03000	0.02700	67	0.03000	0.02700
34	0.05600	0.05040	51	0.03000	0.02700	68	0.03000	0.02700
35	0.05500	0.04950	52	0.03000	0.02700	69	0.03000	0.02700

Appendix – Detailed Assumptions

Withdrawal Rates for Non-Teachers and State (4 to 5 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.04500	0.04500	36	0.02850	0.02850	53	0.01500	0.01500
20	0.04500	0.04500	37	0.02700	0.02700	54	0.01500	0.01500
21	0.04350	0.04350	38	0.02550	0.02550	55	0.01500	0.01500
22	0.04200	0.04200	39	0.02400	0.02400	56	0.01425	0.01425
23	0.04050	0.04050	40	0.02250	0.02250	57	0.01350	0.01350
24	0.03900	0.03900	41	0.02175	0.02175	58	0.01275	0.01275
25	0.03750	0.03750	42	0.02100	0.02100	59	0.01200	0.01200
26	0.03750	0.03750	43	0.02025	0.02025	60	0.01125	0.01125
27	0.03750	0.03750	44	0.01950	0.01950	61	0.01125	0.01125
28	0.03750	0.03750	45	0.01875	0.01875	62	0.01125	0.01125
29	0.03750	0.03750	46	0.01800	0.01800	63	0.01125	0.01125
30	0.03750	0.03750	47	0.01725	0.01725	64	0.01125	0.01125
31	0.03600	0.03600	48	0.01650	0.01650	65	0.01125	0.01125
32	0.03450	0.03450	49	0.01575	0.01575	66	0.01125	0.01125
33	0.03300	0.03300	50	0.01500	0.01500	67	0.01125	0.01125
34	0.03150	0.03150	51	0.01500	0.01500	68	0.01125	0.01125
35	0.03000	0.03000	52	0.01500	0.01500	69	0.01125	0.01125

Withdrawal Rates for Non-Teachers and State (greater than 5 years)

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.04000	0.02800	36	0.02150	0.02170	53	0.01400	0.01366
20	0.04000	0.02800	37	0.02050	0.02065	54	0.01450	0.01383
21	0.03900	0.02765	38	0.01950	0.01960	55	0.01500	0.01400
22	0.03800	0.02730	39	0.01850	0.01855	56	0.01500	0.01400
23	0.03700	0.02695	40	0.01750	0.01750	57	0.01500	0.01400
24	0.03600	0.02660	41	0.01700	0.01680	58	0.01500	0.01400
25	0.03500	0.02625	42	0.01650	0.01610	59	0.01500	0.01400
26	0.03400	0.02590	43	0.01600	0.01540	60	0.01500	0.01400
27	0.03300	0.02555	44	0.01550	0.01470	61	0.01500	0.01400
28	0.03200	0.02520	45	0.01500	0.01400	62	0.01500	0.01400
29	0.03100	0.02485	46	0.01450	0.01383	63	0.01500	0.01400
30	0.03000	0.02450	47	0.01400	0.01366	64	0.01500	0.01400
31	0.02850	0.02415	48	0.01350	0.01350	65	0.01500	0.01400
32	0.02700	0.02380	49	0.01300	0.01333	66	0.01500	0.01400
33	0.02550	0.02345	50	0.01250	0.01316	67	0.01500	0.01400
34	0.02400	0.02310	51	0.01300	0.01333	68	0.01500	0.01400
35	0.02250	0.02275	52	0.01350	0.01350	69	0.01500	0.01400

Appendix – Detailed Assumptions

Disability Rates

Age	Male	Female	Age	Male	Female	Age	Male	Female
19	0.00000	0.00000	33	0.00160	0.00128	47	0.00372	0.00294
20	0.00010	0.00008	34	0.00180	0.00144	48	0.00418	0.00322
21	0.00018	0.00014	35	0.00200	0.00160	49	0.00463	0.00349
22	0.00026	0.00021	36	0.00210	0.00168	50	0.00509	0.00376
23	0.00034	0.00027	37	0.00220	0.00176	51	0.00554	0.00413
24	0.00042	0.00034	38	0.00230	0.00184	52	0.00600	0.00450
25	0.00050	0.00040	39	0.00240	0.00192	53	0.00620	0.00486
26	0.00060	0.00048	40	0.00250	0.00200	54	0.00640	0.00523
27	0.00070	0.00056	41	0.00260	0.00208	55	0.00660	0.00560
28	0.00080	0.00064	42	0.00270	0.00216	56	0.00680	0.00624
29	0.00090	0.00072	43	0.00280	0.00224	57	0.00700	0.00688
30	0.00100	0.00080	44	0.00290	0.00232	58	0.00700	0.00752
31	0.00120	0.00096	45	0.00300	0.00240	59	0.00700	0.00816
32	0.00140	0.00112	46	0.00336	0.00267	60	0.00700	0.00880
						61+	0.00000	0.00000

Retirement Rates

Age	Teachers		Non-Teachers and State	
	Male	Female	Male	Female
54	0.000	0.000	0.000	0.000
55	0.250	0.275	0.300	0.200
56	0.150	0.175	0.200	0.150
57	0.150	0.175	0.150	0.150
58	0.170	0.180	0.150	0.150
59	0.190	0.190	0.150	0.175
60	0.200	0.250	0.150	0.200
61	0.300	0.200	0.150	0.200
62	0.400	0.275	0.400	0.300
63	0.250	0.200	0.250	0.200
64	0.250	0.250	0.175	0.200
65	0.400	0.300	0.300	0.300
66	0.300	0.300	0.225	0.200
67	0.300	0.300	0.200	0.200
68	0.300	0.300	0.200	0.200
69	0.300	0.300	0.200	0.200
70+	1.000	1.000	1.000	1.000