



Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve



Virginia
Retirement
System

**Report on the Actuarial Valuation of the
Group Life Insurance Program**

Prepared as of June 30, 2013





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

December 19, 2013

The Board of Trustees
Virginia Retirement System
1200 E. Main Street
Richmond, VA 23219

Dear Trustees:

Governmental Accounting Standards Board Statements No. 43 and No. 45 (GASB 43 and 45) require actuarial valuations of retiree health care and other post employment benefit (OPEB) plans. Cavanaugh Macdonald Consulting, LLC (CMC) is submitting the results of the annual actuarial valuation of the Virginia Retirement System (VRS) Group Life Insurance Program (Plan) prepared as of June 30, 2013. While not verifying the data at source, the actuary performed tests for consistency and reasonability.

This valuation covers only the portion of the Plan providing benefits for current retirees and active employees upon retirement. This valuation does not include the Plan's benefits for members who die while actively employed. Death benefits for active employees are provided under a group term life insurance arrangement. The valuation indicates that the Annual Required Contribution (ARC) under GASB 43 and 45 is 0.98% of active covered payroll. Adjusted to include the cost for deaths in active service, the total contribution rate for the Plan is 1.32% of active covered payroll. Contribution rates for VRS employers are established every two years. The actuarially calculated employer contribution rates based on the current valuation are for fiscal years ending 2015 and 2016.

The promised post-employment death benefits of the Group Life Insurance Program are included in the actuarially calculated contribution rates which are developed using the entry age normal actuarial cost method with projected benefits. Five-year smoothed market value of assets is used for actuarial valuation purposes. GASB 43 and 45 require the discount rate used to value a plan be based on the likely return of the assets used to pay benefits. As of June 30, 2013, the plan has assets in trust solely to provide benefits to eligible recipients. Therefore, the discount rate has been set at 7.00%. In accordance with the new funding policy adopted by the Board of Trustees, the balance of the unfunded accrued liability as of June 30, 2013 is being amortized by regular annual contributions as a level percentage of payroll within a closed 30-year period, on the assumption that payroll will increase by 3.00% annually and the amortization period will decrease by one year until reaching 0 years. The assumptions recommended by the actuary and adopted by the Board are in the aggregate reasonably related to the experience under the Fund and to reasonable expectations of anticipated experience under the Fund and meet the parameters for the disclosures under GASB 43 and 45.

The valuation reflects changes in the actuarial assumptions adopted by the Board of Trustees recommended in the experience study for the four year period ending June 30, 2012. The new assumptions are outlined below and are contained in Schedule C of the report. The following tables summarize the changes in actuarial assumptions.

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144

Phone (678) 388-1700 • Fax (678) 388-1730

www.CavMacConsulting.com

Offices in Englewood, CO • Kennesaw, GA • Bellevue, NE • Hilton Head Island, SC



STATE SYSTEM	ASSUMPTION CHANGE
State	Update mortality table Decrease rates of service retirement Decrease rates of withdrawal for less than 10 years of service Decrease rates of male disability retirement Reduce rates of salary increase by 0.25% per year
Teachers	Update mortality table Adjustments to rates of service retirement Decrease rates of withdrawal for three through nine years of service Decrease rates of disability Reduce rates of salary increase by 0.25% per year
SPORS	Update mortality table Increase rate of service retirement at age 54
VaLORS	Update mortality table Adjustments to rates of service retirement Decrease rates of withdrawal for females under 10 years of service Increase rates of disability Decrease service related disability rate from 60% to 50%
JRS	Update mortality table

POLITICAL SUBDIVISION SYSTEM	ASSUMPTION CHANGE
Largest 10 - Non-LEOs	Update mortality table Decrease rates of service retirement Decrease rates of disability retirement Reduce rates of salary increase by 0.25% per year
Largest 10 - LEOs	Update mortality table Decrease male rates of disability
All Others (Non 10 largest) Non-LEOs	Update mortality table Decrease rates of service retirement Decrease rates of disability retirement Reduce rates of salary increase by 0.25% per year
All Others (Non 10 largest) LEOs	Update mortality table Adjustments to rates of service retirement for females Increase rates of withdrawal Decrease male and female rates of disability



The Board of Trustees
December 19, 2013
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Our organization has only a contractual relationship with the Virginia Retirement System to provide actuarial consulting services and we do not provide other services to nor have a financial interest in the Virginia Retirement System. There are no known interests or relationships that our firm has with the Virginia Retirement System that may impair or appear to impair the objectivity of our work.

This is to certify that the independent consulting actuary is a member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the Plan and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of VRS.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: Plan experience differing from that anticipated by the 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. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

The Table of Contents, which immediately follows, outlines the material contained in the report.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Jose I. Fernandez', with a stylized flourish at the end.

Jose I. Fernandez, ASA, FCA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in blue ink, appearing to read 'Eric H. Gary', with a stylized flourish at the end.

Eric H. Gary, FSA, FCA, MAAA
Chief Health Actuary

JIF/EHG:bcn



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Section I – Summary of Principal Results

1. For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized below:

**GROUP LIFE INSURANCE PROGRAM
(\$ IN THOUSANDS)**

Valuation Date	June 30, 2013	June 30, 2012
Number Active	361,080	360,602
Number Retired or Disabled	<u>152,622</u>	<u>146,314</u>
Total	513,702	506,916
Annual Covered Payroll	\$17,132,176	\$16,696,961
Assets:		
Market Value	\$ 887,773	\$ 746,619
Actuarial Value	\$ 836,547	\$ 755,889
Unfunded Actuarial Liability	\$ 1,735,144	\$ 1,702,421
Amortization Period (Years)	30	29
Insurance Amount		
Active Members	\$ 34,264,352	\$ 33,393,922
Retired and Disabled Members	<u>7,006,128</u>	<u>6,658,865</u>
Total	\$ 41,270,480	\$ 40,052,787
Annual Required Contribution (ARC) in Dollars:		
Normal Cost	\$ 72,495	\$ 77,563
Accrued Liability	<u>95,231</u>	<u>95,165</u>
Total	\$ 167,726	\$ 172,728
ARC as a Percent of Active Payroll:		
Normal Cost	0.42%	0.46%
Accrued Liability	<u>0.56</u>	<u>0.57</u>
Total	0.98%	1.03%
Adjustment for Active Group Life Insurance	<u>0.34%</u>	<u>0.35%</u>
Total Cost for Program	1.32%	1.38%
Contribution as ¢ per \$1,000 of Active Insurance Amount		
Active Members	14.1¢	14.7¢
Retired and Disabled Members	<u>40.8</u>	<u>43.1</u>
Total	54.9¢	57.8¢
Discount Rate	7.00%	7.00%



Section I – Summary of Principal Results (continued)

2. The contribution rates based on the June 30, 2012 valuation are presented for informational purposes only. The valuation as of June 30, 2013 indicates the Annual Required Contribution (ARC) is 1.32% of active payroll payable for the fiscal years 2015 and 2016. Comments on the valuation results as of June 30, 2013 are given in Section IV and further discussion of the contribution levels is provided in Section V.
3. The cost of benefits for members who die in active service is covered on a one-year term basis through an insurance company, and is not included in the actuarial valuation. The term cost for these active members has been provided to CMC by VRS and is currently 14.1¢ per \$1,000 of insurance. This cost is included on the previous page to provide a combined contribution rate for deaths in active service and post-employment benefits.
4. The main plan provisions of the Group Life Insurance Program, as summarized in Schedule E, were taken into account in the current valuation.
5. Changes to the actuarial assumptions since the previous valuation include:

STATE SYSTEM	ASSUMPTION CHANGE
State	Update mortality table Decrease rates of service retirement Decrease rates of withdrawal for less than 10 years of service Decrease rates of male disability retirement Reduce rates of salary increase by 0.25% per year
Teachers	Update mortality table Adjustments to rates of service retirement Decrease rates of withdrawal for three through nine years of service Decrease rates of disability Reduce rates of salary increase by 0.25% per year
SPORS	Update mortality table Increase rate of service retirement at age 54
VaLORS	Update mortality table Adjustments to rates of service retirement Decrease rates of withdrawal for females under 10 years of service Increase rates of disability Decrease service related disability rate from 60% to 50%
JRS	Update mortality table



Section I – Summary of Principal Results (continued)

POLITICAL SUBDIVISION SYSTEM	ASSUMPTION CHANGE
Largest 10 - Non-LEOs	Update mortality table Decrease rates of service retirement Decrease rates of disability retirement Reduce rates of salary increase by 0.25% per year
Largest 10 - LEOs	Update mortality table Decrease male rates of disability
All Others (Non 10 largest) Non-LEOs	Update mortality table Decrease rates of service retirement Decrease rates of disability retirement Reduce rates of salary increase by 0.25% per year
All Others (Non 10 largest) LEOs	Update mortality table Adjustments to rates of service retirement for females Increase rates of withdrawal Decrease male and female rates of disability

6. Schedule B shows the development of the actuarial value of assets. Schedule C and Schedule D of this report outline the full set of actuarial assumptions and methods used in the current valuation. The political subdivisions have been divided into two groups. Group A consists of: City of Virginia Beach, Henrico County, Prince William County, Chesterfield County, City of Chesapeake, City of Alexandria, City of Hampton, Loudoun County, City of Lynchburg, and the City of Portsmouth. Group B is all other political subdivisions not included in Group A.



Section II – Membership Data

1. Data regarding the membership of VRS for use as a basis of the valuation were furnished by VRS. The following table shows the number of active members and their annual compensation, as of June 30, 2013, on the basis of which the valuation was prepared.

TABLE 1
THE NUMBER, ANNUAL COVERED PAYROLL, AND INSURANCE
AMOUNT OF ACTIVE MEMBERS AS OF JUNE 30, 2013
(\$ IN THOUSANDS)

Group	Number	Covered Payroll	Insurance Amount
State Employees	75,879	\$ 3,716,548	\$ 7,433,096
Teachers	147,257	7,211,544	14,423,088
VRS Political Subdivisions	105,139	4,340,964	8,681,928
SPORS	2,002	109,006	218,012
JRS	381	57,110	114,220
VaLORS	9,372	342,154	684,308
Life Insurance Only	<u>21,050</u>	<u>1,354,850</u>	<u>2,709,700</u>
Total	361,080	\$17,132,176	\$34,264,352

The group shown above as “Life Insurance Only” consists of political subdivisions not providing VRS pension benefits and eligible members in the Optional Retirement Plan (ORP).

Schedule F, which can be found at the end of this report, shows the distribution by age and service of the number of active members included in the valuation.



Section II – Membership Data (continued)

2. The following table shows a six-year history of active member valuation data.

TABLE 2

SCHEDULE OF TOTAL ACTIVE MEMBER VALUATION DATA

Valuation Date	Number	Annual Payroll (\$ in Thousands)	Annual Average Pay	% Change in Average Pay
6/30/2013	361,080	\$17,132,176	\$47,447	2.47%
6/30/2012	360,602	16,696,961	46,303	0.36
6/30/2011	358,536	16,542,753	46,139	0.97
6/30/2010	361,644	16,526,260	45,698	(0.10)
6/30/2009	365,682	16,728,060	45,745	2.67
6/30/2008	365,103	16,267,352	44,556	6.73

3. The following table shows the number of covered retired or disabled members on the roll as of June 30, 2013 together with the amount of their insurance in force under the plan as of that date.

TABLE 3

NUMBER AND INSURANCE AMOUNT OF COVERED RETIRED OR DISABLED MEMBERS AS OF JUNE 30, 2013 (\$ IN THOUSANDS)

Group	Number	Insurance Amount
Service Retirees	135,540	\$6,094,467
Disabled Members	<u>17,082</u>	<u>911,661</u>
Total	152,622	\$7,006,128

The numbers shown above include members on long-term disability who are receiving benefits from the Virginia Sickness and Disability Program (VSDP). The valuation results include an estimate of retiree liability from the "Life Insurance Only" group.



Section II – Membership Data (continued)

4. The following table shows a six-year history of members retired for service or receiving disability benefits.

TABLE 4

SCHEDULE OF RETIRANTS AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS*

Valuation Date	Retirees			Current Total Life Insurance Amount	Annualized % Increase in Life Insurance Amount	Average Life Insurance Amount	% Increase in Average Life Insurance Amount
	Added	Removed	Total				
6/30/2013	12,910	6,602	152,622	\$7,006,128	5.22%	\$45,905	0.87%
6/30/2012	9,787	3,864	146,314	6,658,865	4.58	45,511	0.35
6/30/2011	11,216	4,325	140,391	6,366,958	8.35	45,352	3.03
6/30/2010	10,048	2,577	133,500	5,876,393	8.49	44,018	2.42
6/30/2009	8,296	10,816	126,029	5,416,588	8.66	42,979	10.83
6/30/2008	n/a	n/a	128,549	4,984,937	n/a	38,778	n/a

*This schedule does not include life insurance benefits payable upon the death of an active member.



Section III – Assets

Schedule B shows the additions and deductions of the Plan for the year preceding the valuation date and a reconciliation of the fund balances at market value. As of June 30, 2013, the market value of assets used to determine the actuarial value of assets is \$887,773,000.

The five-year market related actuarial value of assets used for the current valuation is \$836,547,000. Schedule B shows the development of the actuarial value of assets as of June 30, 2013.



Section IV – Comments on Valuation

1. The June 30, 2013 valuation shows the Plan has total prospective liabilities of \$3,073,290,000, of which \$1,422,423,000 is for the prospective death benefits payable on account of present retired and disabled members, and \$1,650,867,000 is for the prospective post-employment death benefits payable on account of present active members. Against these benefit liabilities, the Plan has a total present actuarial value of assets of \$836,547,000 as of June 30, 2013. The difference of \$2,236,743,000 between the total liabilities and the total present actuarial value of assets represents the present value of contributions to be made in the future on account of benefits. Schedule A of this report outlines the results of the actuarial valuation.
2. The contributions for the Plan on account of post-employment death benefits consist of normal contributions and accrued liability contributions. The normal contribution is equal to the actuarial present value of benefits accruing during the current year. The valuation indicates the normal contribution for the Plan is 0.42% of total active covered payroll.
3. Prospective normal contributions have a present value of \$501,599,000. When this amount is subtracted from \$2,236,743,000, which is the present value of the total future contributions to be made by the employers, there remains \$1,735,144,000 as the amount of future accrued liability contributions.
4. For the Plan, it is recommended that the accrued liability contribution rate payable by employers on account of retirement benefits be set at 0.56% of total active covered payroll. This rate is sufficient to liquidate the unfunded accrued liability of \$1,735,144,000 over 30 years, based on a 7.00% investment rate of return and the assumption that the payroll will increase by 3.00% annually. The valuation was prepared in accordance with the actuarial assumptions and the actuarial cost method, which are described in Schedule C and Schedule D.
5. The total annual required contribution (ARC) is 0.98% of total active covered payroll. This rate is equivalent to 40.8¢ per month per \$1,000 of active members' life insurance.



Section IV – Comments on Valuation (continued)

6. This valuation determines the cost of advance funding the post-employment death benefits under the Plan. The cost of death benefits for members who die in active service is covered on a one-year term basis through an insurance company and is not included in the actuarial valuation. The term cost for these active members has been provided to CMC by VRS and is currently 14.1¢ per month per \$1,000 of insurance.
7. The sum of the active term cost of 14.1¢ per \$1,000 of active members' life insurance and the post-employment advance funding cost of 40.8¢ per \$1,000 of active members' life insurance is 54.9¢ per \$1,000 of active members' life insurance.



Section V – Contribution Rates

1. The table below shows the normal contribution rate, the unfunded actuarial accrued liability (UAAL), amortization period and the actuarially required contribution rate with a 30-year amortization for post-employment life insurance benefits.

TABLE 5

**EMPLOYER CONTRIBUTION RATE EXPRESSED
AS PERCENT OF ACTIVE MEMBER COVERED PAYROLL**

	June 30, 2013
Normal Cost	0.42%
Percent to Amortize Unfunded Actuarial Accrued Liability (UAAL)	<u>0.56%</u>
Actuarial Required Contribution Rate to Pay Normal Cost and Amortize UAAL	0.98%
Number of Years to Amortize UAAL	30 Years

2. Contributions to the Plan consist of one-year term active member life insurance provided through an insurance company, and advance funding payments to support post-employment life insurance. On the basis of the valuation, we are recommending a total contribution rate of 54.9¢ per month per \$1,000 of active members' life insurance. The recommended contributions are summarized in the following table:

TABLE 6

**EMPLOYER CONTRIBUTION RATE EXPRESSED
AS CENTS PER \$1,000 OF LIFE INSURANCE COVERAGE**

Recommended Contribution	Rate	
	¢ per \$1,000 of Active Members' Life Insurance	% of Covered Payroll
Active Member Term Cost	14.1¢	0.34%
Post-Employment Advance Funding	<u>40.8¢</u>	<u>0.98%</u>
Total	54.9¢	1.32%



Section VI – Accounting Information

- GASB 43 and 45 set forth certain items of required supplementary information to be disclosed in the financial statements of VRS and the employer. One such item is a distribution of the number of members by type of membership, as follows:

**NUMBER OF ALL MEMBERS
AS OF JUNE 30, 2013**

Group	Count
Active Members	361,080
Service Retirees	135,540
Disabled Members	<u>17,082</u>
Total	513,702

- Another such item is the Schedule of Funding Progress, shown in the following table:

**SCHEDULE OF FUNDING PROGRESS
(\$ IN THOUSANDS)**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b - a) / c)
6/30/2013	\$836,547	\$2,571,691	\$1,735,144	32.53%	\$17,132,176	10.13%
6/30/2012	755,889	2,458,310	1,702,421	30.75	16,696,961	10.20
6/30/2011	852,424	2,358,977	1,506,553	36.14	16,542,753	9.11
6/30/2010	928,920	2,245,315	1,316,395	41.37	16,526,260	7.97
6/30/2009	967,188	1,994,799	1,027,611	48.49	16,728,060	6.14
6/30/2008	974,869	1,771,370	796,501	55.03	16,267,352	4.90



Section VI – Accounting Information

3. The information presented in the required supplementary schedules was determined as part of the actuarial valuation at June 30, 2013. Additional information as of the latest actuarial valuation follows:

Valuation date	6/30/2013
Actuarial cost method	Entry Age Normal
Amortization method	Level Percentage of Pay, Closed
Payroll Growth Rate	3.00%
Remaining amortization period	30 years
Asset valuation method	5-year Smoothed Market
Actuarial assumptions:	
Investment Rate of Return*	7.00%
*Includes inflation at	2.50%

The assumed investment rate of return reflects the fact a Trust has been established to set aside assets that are legally held exclusively for post-employment death benefits.



Section VII – Derivation of Experience Gains and Losses

**CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITIES (UAAL)
DURING FISCAL YEAR 2013
(\$ IN MILLIONS)**

FISCAL YEAR	2013
1. Beginning of Year:	
(a) Actuarial Accrued Liability (AAL)	\$ 2,458.3
(b) Normal Cost	\$ 77.6
(c) Benefit Payments	\$ 149.5
2. End of Year:	
(a) Expected AAL $[(1a) + (1b)] \times 1.07 - [(1c) \times (1 + [0.07 \times 0.50])]$	\$ 2,558.7
(b) Actual AAL	\$ 2,571.7
1. Total AAL Gain (or Loss) (2a) – (2b)	\$ (13.0)
(a) Gain/(Loss) due to assumption changes	\$ 9.0
(b) Experience Gain/(Loss)	\$ (22.0)
4. Actuarial Value of Assets (AVA) Beginning of Year	\$ 755.9
5. Net external cash flow during the year	\$ 52.2
6. End of Year:	
(a) Expected AVA $[(4) \times 1.07] + [(5) \times (1 + [0.07 \times 0.50])]$	\$ 862.8
(b) Actual AVA	\$ 836.5
7. AVA Gain (or Loss) (6b) – (6a)	\$ (26.3)
8. Expected UAAL at End of Year (2a) – (6a)	\$ 1,695.9
9. Actual UAAL at End of Year (2b) – (6b)	\$ 1,735.2
10. UAAL Gain (or Loss) (8) – (9)	\$ (39.3)



Schedule A – Results of the Valuation

**GROUP LIFE INSURANCE PROGRAM
(\$ IN THOUSANDS)**

VALUATION DATE		June 30, 2013	June 30, 2012
1.	COVERED PAYROLL	\$ 17,132,176	\$ 16,696,961
2.	ACTUARIAL ACCRUED LIABILITY		
	Present value of prospective benefits payable in respect of:		
	(a) Present active members	\$ 1,650,867	\$ 1,681,215
	(b) Present retired and disabled members	<u>1,422,423</u>	<u>1,308,096</u>
	(c) Total present value of prospective benefits	\$ 3,073,290	\$ 2,989,311
	(d) Present value of future normal contributions	<u>501,599</u>	<u>531,001</u>
	(e) Total actuarial accrued liability (2c) – (2d)	\$ 2,571,691	\$ 2,458,310
3.	PRESENT ASSETS FOR VALUATION PURPOSES	\$ 836,547	\$ 755,889
4.	UNFUNDED ACTUARIAL ACCRUED LIABILITY (2e) – (3)	\$ 1,735,144	\$ 1,702,421
5.	AMORTIZATION PERIOD	30	29
6.	NORMAL CONTRIBUTION	\$ 72,495	\$ 77,563
7.	ACCRUED LIABILITY CONTRIBUTION	<u>95,231</u>	<u>95,165</u>
8.	TOTAL CONTRIBUTION BASED ON COVERED PAYROLL (6) + (7)	\$ 167,726	\$ 172,728
9.	NORMAL CONTRIBUTION AS A PERCENT OF COVERED PAYROLL (6) ÷ (1)	0.42%	0.46%
10.	ACCRUED LIABILITY CONTRIBUTION AS A PERCENT OF COVERED PAYROLL (7) ÷ (1)	<u>0.56%</u>	<u>0.57%</u>
11.	TOTAL CONTRIBUTION AS A PERCENT OF COVERED PAYROLL (9) + (10)	0.98%	1.03%
12.	ADJUSTEMENT FOR ACTIVE GROUP LIFE INSURANCE	<u>0.34%</u>	<u>0.35%</u>
13.	TOTAL ANNUAL REQUIRED CONTRIBUTION FOR PROGRAM (11) + (12)	1.32%	1.38%
14.	DISCOUNT RATE	7.00%	7.00%



Schedule A – Solvency Test

**SOLVENCY TEST
(\$ IN THOUSANDS)**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors, and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2013	n/a	\$1,422,423	\$1,149,268	\$2,571,691	\$836,547	n/a	58.81%	0.00%
6/30/2012	n/a	1,308,096	1,150,214	2,458,310	755,889	n/a	57.79	0.00
6/30/2011	n/a	1,228,335	1,130,642	2,358,977	852,424	n/a	69.40	0.00
6/30/2010	n/a	1,140,158	1,105,157	2,245,315	928,920	n/a	81.47	0.00
6/30/2009	n/a	995,206	999,593	1,994,799	967,188	n/a	97.18	0.00
6/30/2008	n/a	912,508	858,862	1,771,370	974,869	n/a	100.00	7.26



Schedule B – Plan Assets

GASB 43 and 45 define plan assets as resources, usually in the form of stocks, bonds, and other classes of investments, that have been segregated and restricted in a trust, or equivalent arrangement, in which (a) employer contributions to the plan are irrevocable, (b) assets are dedicated to providing benefits to retirees and their beneficiaries, and (c) assets are legally protected from creditors of the employers or plan administrator, for the payment of benefits in accordance with the terms of the plan.

For valuation purposes, an actuarial value of assets is used. This is a smoothed market value, phasing-in investment returns above or below the 7.00% assumption over five years. This smoothed value is subject to a corridor that restricts the actuarial value of assets from being more than 120% or less than 80% of the market value of assets. The actuarial value of assets used for the valuation is \$836,547,000. The corresponding market value of assets was \$887,773,000.



Schedule B – Plan Assets (continued)

**RECONCILIATION OF ASSETS
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2013	June 30, 2012
1. Market value of assets at beginning of year	\$ 746,619	\$ 833,065
Revenue for the year		
Contributions		
Member	\$ 119,593	\$ (4)
Employer	<u>81,122</u>	<u>46,538</u>
Total contributions	\$ 200,715	\$ 46,534
Net investment income	\$ 90,166	\$ 7,295
Miscellaneous revenue	<u>973</u>	<u>751</u>
2. Total revenue	\$ 291,854	\$ 54,580
Expenditures for the year		
Benefit payments	\$ 149,487	\$ 140,941
Administrative expenses	65	77
Other expenses	<u>1,148</u>	<u>8</u>
3. Total expenditures	\$ 150,700	\$ 141,026
4. Change in net assets (2) – (3)	\$ 141,154	\$ (86,446)
5. Market value of assets at end of year (1) + (4)	\$ 887,773	\$ 746,619



Schedule B – Plan Assets (continued)

**DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2013
1. Excess (Shortfall) of invested income for current and previous three years	
a. Current Year	\$ 34,863
b. First Prior Year	(47,050)
c. Second Prior Year	98,768
d. Third Prior Year	<u>60,294</u>
e. Total for four years	\$ 146,386
2. Deferral of excess (shortfall) of investment income	
a. Current Year at 80%: (1a) x 0.80	\$ 27,890
b. First Prior Year at 60%: (1b) x 0.60	(28,230)
c. Second Prior Year at 40%: (1c) x 0.40	39,507
d. Third Prior Year at 20%: (1d) x 0.20	<u>12,509</u>
e. Total for four years	\$ 51,226
3. Market value of assets at end of year	\$ 887,773
4. Preliminary actuarial value of assets at end of year: (3) – (2e)	\$ 836,547
5. Actuarial value of assets corridor	
a. 80% of market value at end of year: (3) x 0.80	\$ 710,218
b. 120% of market value at end of year: (3) x 1.20	\$ 1,065,328
6. Actuarial value of assets at end of year	\$ 836,547



Schedule B – Plan Assets (continued)

**CALCULATION OF EXCESS (SHORTFALL) INVESTMENT INCOME
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2013	June 30, 2012
1. Market value of assets at beginning of year	\$ 746,619	\$ 833,065
2. Net external cash flow during the year	\$ 52,201	\$ (94,492)
3. Market value of assets at end of year	\$ 887,773	\$ 746,619
4. Actual investment income during the year based on market value: (3) – (2) – (1)	\$ 88,953	\$ 8,046
5. Assumed earning rate	7.00%	7.00%
6. Expected earnings for the year		
a. Market value of assets at beginning of year	\$ 52,263	\$ 58,315
b. Net external cash flow	<u>1,827</u>	<u>(3,219)</u>
c. Total: (6a) + (6b)	\$ 54,090	\$ 55,096
7. Excess investment income for the year: (4) – (6c)	\$ 34,863	\$ (47,050)



Schedule B – Plan Assets (continued)

**HISTORY OF CASH FLOW
(\$ IN THOUSANDS)**

Year Ending June 30	Contributions	Expenditures	External Cash Flow for the Year	Market Value of Assets End of Year	External Cash Flow as % of Market Value
2001	\$ 88,624	\$ 88,179	\$ 445	\$938,119	0.05%
2002	68,800	95,625	(26,825)	838,601	(3.20)
2003	44	105,195	(105,151)	751,747	(13.99)
2004	20	107,018	(106,998)	778,464	(13.74)
2005	(31)	97,041	(97,072)	771,817	(12.58)
2006	52	112,695	(112,643)	751,361	(14.99)
2007	169,824	119,738	50,086	962,328	5.20
2008	158,823	133,033	25,790	937,258	2.75
2009	135,063	153,083	(18,020)	713,812	(2.52)
2010	94,860	139,344	(44,484)	783,058	(5.68)
2011	44,695	146,550	(101,855)	832,796	(12.23)
2012	46,534	141,026	(94,492)	746,619	(12.66)
2013	201,688	149,487	52,201	887,773	5.88



Schedule C – Outline of Actuarial Assumptions and Methods

Assumptions and Methods Applicable to all Group Life Insurance Program Employer Groups

Investment Return Rate:	7.00% per annum, compounded annually (net of administrative expenses).
Inflation Assumption:	2.50% per year.
Actuarial Cost Method:	Entry age normal cost method, allocated as a level percent of payroll, from first funding age to last age before terminal retirement age. Actuarial gains and losses, as they occur, are reflected in the unfunded actuarial accrued liability. See Schedule D for a detailed explanation.
Funding Period:	30 years from the valuation date decreasing by one year each year in subsequent valuation until reaching 0 years (closed amortization, computed as a level percent of payroll).
Payroll Growth Rate:	3.00% per annum.
Asset Valuation Method:	The method of valuing assets is intended to recognize a “smoothed” market value of assets. Under this method, the difference between actual return on market value from investment experience and the expected return on market value is recognized over a five-year period. The resulting actuarial value of asset value cannot be less than 80% or more than 120% of the market value of assets.
“Life Insurance Only” Retirees:	Results include an estimate of retiree liability for groups not providing retiree census data. A liability equaling 10% of the active employee liability times the average retiree to active liability ratio is assumed.
Hybrid Retirement Plan:	The valuation assumes no eligible members will elect to opt into the Hybrid Retirement Plan during the election window to be held January 1 through April 30, 2014.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

STATE*

NORMAL RETIREMENT ELIGIBILITY:

Plan 1 Members (Members hired prior to July 1, 2010 and who were vested as of January 1, 2013):

A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service.

Plan 2 Members (Members hired on or after July 1, 2010, or members hired prior to July 1, 2010 and who were not vested as of January 1, 2013):

A member may retire with unreduced pension benefits upon Normal Retirement once they attain their normal Social Security retirement age and have at least five years of service.

EARLY RETIREMENT ELIGIBILITY:

Plan 1 Members:

A member may retire early with unreduced pension benefits after reaching age 50 with at least 30 years service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.

Plan 2 Members:

A member may retire early with unreduced pension benefits upon the sum of their age and their service being 90 (Rule of 90). A member may retire early with reduced pension benefits after reaching age 60 with at least five years of service credit.

DISABILITY – NON-VSDP:

A Plan 1 Member hired prior to January 1, 1999 and who has declined VSDP coverage is eligible for disability retirement benefits from the first day of employment.

DISABILITY – VSDP:

A Plan 1 Member hired prior to January 1, 1999 and who has elected VSDP coverage or any member hired on or after January 1, 1999. Applicable members hired prior to July 1, 2009 are eligible from the first day of employment for work related and non-work related VSDP disability benefits. Applicable members hired on or after July 1, 2009 are eligible from the first day of employment for work-related VSDP disability benefits, but must have a minimum of one year of service to be eligible for non-work related VSDP disability benefits.

*The actuarial assumptions for State are also applied to the applicable members of the Optional Retirement Plan (ORP).



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

STATE

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 2 years and Females set back 3 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Females set back 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00026	0.00024	0.00000	0.00014	0.00014	0.00000
25	0.00035	0.00031	0.02257	0.00014	0.00015	0.00745
30	0.00051	0.00040	0.02257	0.00018	0.00020	0.00745
35	0.00082	0.00070	0.02257	0.00030	0.00036	0.00745
40	0.00099	0.00092	0.02257	0.00043	0.00048	0.00745
45	0.00128	0.00116	0.02257	0.00063	0.00076	0.00745
50	0.00163	0.00149	0.02512	0.00092	0.00108	0.01154
55	0.00258	0.00247	0.03156	0.00148	0.00198	0.01654
60	0.00437	0.00489	0.03803	0.00272	0.00402	0.02184
65	0.00662	0.00961	0.04498	0.00421	0.00780	0.02803
70	0.00000	0.01641	0.05445	0.00000	0.01344	0.03764
75		0.02854	0.06941		0.02212	0.05223
80		0.05265	0.09215		0.03607	0.07231
85		0.09624	0.12188		0.06041	0.10020
90		0.16928	0.15524		0.11221	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

STATE

RETIREMENT RATES:

Plan 1 Members: The following rates of retirement are assumed for members eligible to retire.

State Retirement Rates, Plan 1				
Age	Males		Females	
	Years of Service			
	0-29	>=30	0-29	>=30
<=49	0.000	0.000	0.000	0.000
50	0.035	0.130	0.032	0.100
51	0.035	0.125	0.031	0.100
52	0.035	0.090	0.030	0.100
53	0.035	0.104	0.030	0.100
54	0.035	0.108	0.035	0.100
55	0.050	0.115	0.050	0.100
56	0.055	0.130	0.050	0.100
57	0.049	0.130	0.045	0.100
58	0.045	0.120	0.055	0.100
59	0.045	0.135	0.055	0.100
60	0.060	0.170	0.055	0.150
61	0.105	0.190	0.100	0.200
62	0.175	0.310	0.150	0.300
63	0.130	0.210	0.150	0.200
64	0.165	0.290	0.150	0.200
65	0.400	0.410	0.300	0.400
66	0.400	0.275	0.300	0.300
67	0.400	0.240	0.300	0.250
68	0.400	0.210	0.300	0.250
69	0.400	0.100	0.300	0.200
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

STATE

RETIREMENT RATES:

Plan 2 Members: The following rates of retirement are assumed for members eligible to retire.

State Rates of Retirement, Plan 2				
Age	Males		Females	
	Age & Service Meets Rule of 90			
	No	Yes	No	Yes
<=49	0.000	0.000	0.000	0.000
50	0.000	0.350	0.000	0.350
51	0.000	0.100	0.000	0.100
52	0.000	0.100	0.000	0.100
53	0.000	0.100	0.000	0.100
54	0.000	0.100	0.000	0.100
55	0.000	0.100	0.000	0.100
56	0.000	0.100	0.000	0.100
57	0.000	0.100	0.000	0.100
58	0.000	0.100	0.000	0.100
59	0.000	0.100	0.000	0.100
60	0.050	0.100	0.055	0.150
61	0.100	0.150	0.100	0.200
62	0.150	0.250	0.150	0.300
63	0.150	0.200	0.150	0.200
64	0.150	0.200	0.150	0.200
65	0.300	0.300	0.300	0.400
66	0.300	0.250	0.300	0.300
67	0.300	0.250	0.300	0.250
68	0.300	0.200	0.300	0.250
69	0.300	0.200	0.300	0.200
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

STATE

DISABILITY RATES: As shown below for selected ages. 14% of disabilities are assumed to be service related.

State Disability Rates		
Age	Male	Female
20	0.00090	0.00010
25	0.00090	0.00100
30	0.00180	0.00150
35	0.00180	0.00250
40	0.00180	0.00290
45	0.00360	0.00340
50	0.00450	0.00550
55	0.00540	0.00810
60	0.00720	0.01000
65	0.00630	0.00900
70	0.00000	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

STATE

TERMINATION RATES:

The following withdrawal rates are used based on age and service. (For causes other than death, disability, or retirement)

State Rates of Termination, Plan 1						
Age	Male			Female		
	Years of Service					
	0-2	3-9	>=10	0-2	3-9	>=10
20	0.245	0.175	0.000	0.283	0.198	0.000
25	0.221	0.130	0.000	0.256	0.157	0.000
30	0.199	0.110	0.050	0.212	0.130	0.060
35	0.167	0.093	0.045	0.178	0.110	0.050
40	0.145	0.075	0.034	0.155	0.090	0.036
45	0.129	0.070	0.023	0.139	0.074	0.025
50	0.115	0.061	0.000	0.130	0.063	0.000
55	0.102	0.060	0.000	0.125	0.000	0.000
60	0.106	0.000	0.000	0.123	0.000	0.000
65	0.113	0.000	0.000	0.140	0.000	0.000
70	0.131	0.000	0.000	0.249	0.000	0.000

State Rates of Termination, Plan 2						
Age	Male			Female		
	Years of Service					
	0-2	3-9	>=10	0-2	3-9	>=10
20	0.245	0.175	0.000	0.283	0.198	0.000
25	0.221	0.130	0.000	0.256	0.157	0.000
30	0.199	0.110	0.050	0.212	0.130	0.060
35	0.167	0.093	0.045	0.178	0.110	0.050
40	0.145	0.075	0.034	0.155	0.090	0.036
45	0.129	0.070	0.023	0.139	0.074	0.025
50	0.115	0.061	0.020	0.130	0.063	0.020
55	0.102	0.060	0.004	0.125	0.060	0.004
60	0.106	0.000	0.000	0.123	0.000	0.000
65	0.113	0.000	0.000	0.140	0.000	0.000
70	0.131	0.000	0.000	0.249	0.000	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

STATE

SALARY INCREASE RATES: The following total salary increase rates are used. The total salary increase rate consists of an inflation rate of 2.50%, a productivity component of 1.00%, and a variable merit component that is dependent on years of service.

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1 - 2	5.35%
3	4.75
4 - 6	4.45
7	4.35
8	4.25
9 - 10	4.00
11 - 19	3.65
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

TEACHERS*

NORMAL RETIREMENT ELIGIBILITY:

Plan 1 Members (Members hired prior to July 1, 2010 and who were vested as of January 1, 2013):

A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service.

Plan 2 Members (Members hired on or after July 1, 2010, or members hired prior to July 1, 2010 and who were not vested as of January 1, 2013):

A member may retire with unreduced pension benefits upon Normal Retirement once they attain their normal Social Security retirement age and have at least five years of service.

EARLY RETIREMENT ELIGIBILITY:

Plan 1 Members:

A member may retire early with unreduced pension benefits after reaching age 50 with at least 30 years service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.

Plan 2 Members:

A member may retire early with unreduced pension benefits upon the sum of their age and their service being 90 (Rule of 90). A member may retire early with reduced pension benefits after reaching age 60 with at least five years of service credit.

DISABILITY:

A member is eligible for disability retirement benefits from the first day of employment.

*The actuarial assumptions for Teachers are also applied to the applicable members of the Optional Retirement Plan (ORP).



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

TEACHERS

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set back 3 years and Females set back 5 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Males set back 2 years and Females set back 3 years.

Post-Disablement:

RP-2000 Disabled Life Mortality Table Projected to 2020 with Males set back 1 year and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00021	0.00022	0.00000	0.00012	0.00014	0.00000
25	0.00026	0.00028	0.01737	0.00014	0.00014	0.00562
30	0.00035	0.00036	0.02042	0.00016	0.00018	0.00609
35	0.00051	0.00057	0.02042	0.00022	0.00030	0.00597
40	0.00082	0.00086	0.01961	0.00038	0.00043	0.00551
45	0.00099	0.00104	0.01773	0.00052	0.00063	0.00540
50	0.00128	0.00135	0.01965	0.00081	0.00092	0.00819
55	0.00163	0.00195	0.02280	0.00119	0.00152	0.01409
60	0.00258	0.00382	0.02946	0.00215	0.00315	0.01976
65	0.00437	0.00755	0.03644	0.00356	0.00602	0.02535
70	0.00000	0.01348	0.04497	0.00000	0.01100	0.03405
75		0.02246	0.05729		0.01832	0.04448
80		0.04094	0.08287		0.02964	0.06283
85		0.07640	0.11724		0.04892	0.08884
90		0.13623	0.15309		0.08892	0.13188

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

TEACHERS

RETIREMENT RATES:

Plan 1 Members: The following rates of retirement are assumed for members eligible to retire.

Teachers Rates of Retirement, Plan 1				
Age	Male		Female	
	Years of Service			
	0-29	>=30	0-29	>=30
<=49	0.000	0.000	0.000	0.000
50	0.020	0.175	0.020	0.150
51	0.020	0.175	0.024	0.150
52	0.020	0.175	0.027	0.150
53	0.023	0.175	0.024	0.150
54	0.040	0.175	0.037	0.150
55	0.057	0.225	0.061	0.225
56	0.046	0.225	0.054	0.225
57	0.045	0.225	0.057	0.225
58	0.066	0.225	0.062	0.225
59	0.070	0.225	0.075	0.225
60	0.075	0.225	0.085	0.225
61	0.110	0.300	0.120	0.300
62	0.170	0.350	0.170	0.350
63	0.140	0.350	0.160	0.350
64	0.180	0.300	0.165	0.350
65	0.300	0.400	0.300	0.350
66	0.300	0.400	0.300	0.350
67	0.300	0.400	0.300	0.350
68	0.300	0.400	0.300	0.350
69	0.300	0.400	0.300	0.350
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

TEACHERS

RETIREMENT RATES:

Plan 2 Members: The following rates of retirement are assumed for members eligible to retire.

Teachers Rates of Retirement, Plan 2				
Age	Male		Female	
	Age & Service Meets Rule of 90			
	No	Yes	No	Yes
<=49	0.000	0.000	0.000	0.000
50	0.000	0.400	0.000	0.350
51	0.000	0.175	0.000	0.150
52	0.000	0.175	0.000	0.150
53	0.000	0.175	0.000	0.150
54	0.000	0.175	0.000	0.150
55	0.000	0.225	0.000	0.225
56	0.000	0.225	0.000	0.225
57	0.000	0.225	0.000	0.225
58	0.000	0.225	0.000	0.225
59	0.000	0.225	0.000	0.225
60	0.075	0.225	0.085	0.225
61	0.110	0.300	0.120	0.300
62	0.170	0.350	0.170	0.350
63	0.140	0.350	0.160	0.350
64	0.180	0.300	0.165	0.350
65	0.300	0.400	0.300	0.350
66	0.300	0.400	0.300	0.350
67	0.300	0.400	0.300	0.350
68	0.300	0.400	0.300	0.350
69	0.300	0.400	0.300	0.350
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

TEACHERS

DISABILITY RATES: As shown below for selected ages.

Teachers Disability Rates		
Age	Male	Female
20	0.00000	0.00000
25	0.00008	0.00004
30	0.00010	0.00010
35	0.00018	0.00030
40	0.00021	0.00036
45	0.00099	0.00042
50	0.00133	0.00090
55	0.00195	0.00204
60	0.00308	0.00240
65	0.00276	0.00330
70	0.00000	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

TEACHERS

TERMINATION RATES: The following withdrawal rates are used based on age and service. (For causes other than death, disability, or retirement)

Teachers Rates of Termination, Plan 1						
Age	Male			Female		
	Years of Service					
	0-2	3-9	>=10	0-2	3-9	>=10
20	0.182	0.143	0.008	0.159	0.160	0.000
25	0.154	0.118	0.008	0.146	0.120	0.150
30	0.149	0.090	0.037	0.164	0.110	0.047
35	0.141	0.073	0.031	0.149	0.090	0.039
40	0.141	0.070	0.025	0.127	0.075	0.028
45	0.147	0.075	0.019	0.117	0.064	0.021
50	0.138	0.070	0.000	0.118	0.058	0.000
55	0.143	0.000	0.000	0.124	0.000	0.000
60	0.166	0.000	0.000	0.129	0.000	0.000
65	0.170	0.000	0.000	0.130	0.000	0.000
70	0.170	0.000	0.000	0.130	0.000	0.000

Teachers Rates of Termination, Plan 2						
Age	Male			Female		
	Years of Service					
	0-2	3-9	>=10	0-2	3-9	>=10
20	0.182	0.143	0.008	0.159	0.143	0.008
25	0.154	0.118	0.008	0.146	0.118	0.008
30	0.149	0.090	0.037	0.164	0.090	0.037
35	0.141	0.073	0.031	0.149	0.073	0.031
40	0.141	0.070	0.025	0.127	0.070	0.025
45	0.147	0.075	0.019	0.117	0.075	0.019
50	0.138	0.070	0.016	0.118	0.070	0.016
55	0.143	0.070	0.003	0.124	0.070	0.003
60	0.166	0.000	0.000	0.129	0.000	0.000
65	0.170	0.000	0.000	0.130	0.000	0.000
70	0.170	0.000	0.000	0.130	0.000	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

TEACHERS

SALARY INCREASE RATES: The following total salary increase rates are used. The total salary increase rate consists of an inflation rate of 2.50%, a productivity component of 1.00%, and a variable merit component that is dependent on years of service.

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1	5.95%
2	5.85
3	5.85
4 - 6	5.45
7 - 9	5.35
10 - 12	4.85
13 - 14	4.75
15 - 16	4.65
17	4.55
18 - 19	4.45
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

NORMAL RETIREMENT ELIGIBILITY:

A member may retire with an unreduced pension benefit upon Normal Retirement on or after age 60 with credit for five years of service.

EARLY RETIREMENT ELIGIBILITY:

A member may retire early with a reduced pension benefit after reaching age 50 with at least five years of service credit.

DISABILITY – NON-VSDP:

A member hired prior to 1/1/1999 and who has declined VSDP coverage is eligible for disability benefits from the first day of employment.

DISABILITY – VSDP:

A Plan 1 Member hired prior to January 1, 1999 and who has elected VSDP coverage or any member hired on or after January 1, 1999. Applicable members hired prior to July 1, 2009 are eligible from the first day of employment for work related and non-work related VSDP disability benefits. Applicable members hired on or after July 1, 2009 are eligible from the first day of employment for work-related VSDP disability benefits, but must have a minimum of one year of service to be eligible for non-work related VSDP disability benefits.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 5 years and Females set back 3 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Females set back 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00031	0.00024	0.00000	0.00014	0.00014	0.00000
25	0.00040	0.00031	0.02257	0.00014	0.00015	0.00745
30	0.00070	0.00040	0.02257	0.00018	0.00020	0.00745
35	0.00092	0.00070	0.02257	0.00030	0.00036	0.00745
40	0.00116	0.00092	0.02257	0.00043	0.00048	0.00745
45	0.00149	0.00116	0.02257	0.00063	0.00076	0.00745
50	0.00206	0.00149	0.02512	0.00092	0.00108	0.01154
55	0.00353	0.00247	0.03156	0.00148	0.00198	0.01654
60	0.00571	0.00489	0.03803	0.00272	0.00402	0.02184
65	0.00000	0.00961	0.04498	0.00000	0.00780	0.02803
70	0.00000	0.01641	0.05445	0.00000	0.01344	0.03764
75		0.02854	0.06941		0.02212	0.05223
80		0.05265	0.09215		0.03607	0.07231
85		0.09624	0.12188		0.06041	0.10020
90		0.16928	0.15524		0.11221	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

RETIREMENT RATES: The following rates of retirement are assumed for members eligible to retire.

SPORS Rates of Retirement		
Age	Years of Service	
	Less Than 25	25 or More
<=49	0.000	0.000
50	0.100	0.150
51	0.100	0.150
52	0.100	0.150
53	0.100	0.150
54	0.100	0.150
55	0.100	0.150
56	0.100	0.150
57	0.100	0.150
58	0.120	0.200
59	0.120	0.200
60	0.250	0.400
61	0.350	0.400
62	0.500	1.000
63	0.500	1.000
>=64	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

DISABILITY RATES: As shown below for selected ages. 60% of disabilities are assumed to be service related.

SPORS Rates of Disability	
Age	Unisex
<=29	0.00000
30	0.00028
35	0.00134
40	0.00210
45	0.00411
50	0.00675
55	0.01001
>=60	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

TERMINATION RATES: The following withdrawal rates are used based on age and service. (For causes other than death, disability, or retirement).

SPORS Rates of Termination						
Age	Males			Females		
	Years of Service					
	0-2	3-9	>=10	0-2	3-9	>=10
20	0.075	0.210	0.030	0.101	0.053	0.036
25	0.075	0.055	0.030	0.108	0.054	0.044
30	0.075	0.045	0.030	0.119	0.057	0.055
35	0.075	0.048	0.024	0.121	0.060	0.061
40	0.075	0.048	0.018	0.117	0.062	0.062
45	0.100	0.045	0.014	0.108	0.064	0.059
50	0.100	0.045	0.012	0.093	0.066	0.052
55	0.100	0.067	0.012	0.074	0.067	0.041
60	0.100	0.075	0.012	0.049	0.068	0.026
65	0.100	0.075	0.012	0.015	0.069	0.006
70	0.100	0.075	0.012	0.000	0.071	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

SALARY INCREASE RATES: The following total salary increase rates are used. The total salary increase rate consists of an inflation rate of 2.50%, a productivity component of 1.00%, and a variable merit component that is dependent on years of service.

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1 - 4	4.75%
5	4.65
6 - 9	4.40
10 - 19	4.00
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

JRS

WEIGHTED SERVICE CREDIT:

Plan 1 Members (Members hired prior to July 1, 2010 and who were vested as of January 1, 2013):

Employees receive credit of one year of service multiplied by a weighting factor of 3.5 (2.5 for judges entering JRS on or after January 1, 1995). Any non-judicial VRS service credit is not weighted.

Plan 2 Members (Members hired on or after July 1, 2010, or members hired prior to July 1, 2010 and who were not vested as of January 1, 2013):

Employees receive credit of one year of service multiplied by a weighting factor of:

- 1.5 for judges entering JRS before age 45,
- 2.0 for judges entering JRS between ages 45 and 54, or
- 2.5 for judges entering JRS at age 55 or older.

Any non-judicial VRS service credit is not weighted.

NORMAL RETIREMENT ELIGIBILITY:

A member may retire upon Normal Retirement on or after age 65 with credit for five years of service, or age 60 with at least 30 years of service credit.

EARLY RETIREMENT ELIGIBILITY:

A member may retire early with unreduced pension benefits at age 60 with at least 30 years of service or a member may retire early with reduced pension benefits after reaching age 55 with at least five years of service credit.

DISABILITY:

A member is eligible for disability retirement benefits from the first day of employment.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

JRS

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 2 years and Females set back 3 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Females set back 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00026	0.00024	0.00000	0.00014	0.00014	0.00000
25	0.00035	0.00031	0.02257	0.00014	0.00015	0.00745
30	0.00051	0.00040	0.02257	0.00018	0.00020	0.00745
35	0.00082	0.00070	0.02257	0.00030	0.00036	0.00745
40	0.00099	0.00092	0.02257	0.00043	0.00048	0.00745
45	0.00128	0.00116	0.02257	0.00063	0.00076	0.00745
50	0.00163	0.00149	0.02512	0.00092	0.00108	0.01154
55	0.00258	0.00247	0.03156	0.00148	0.00198	0.01654
60	0.00437	0.00489	0.03803	0.00272	0.00402	0.02184
65	0.00662	0.00961	0.04498	0.00421	0.00780	0.02803
70	0.00703	0.01641	0.05445	0.00562	0.01344	0.03764
75		0.02854	0.06941		0.02212	0.05223
80		0.05265	0.09215		0.03607	0.07231
85		0.09624	0.12188		0.06041	0.10020
90		0.16928	0.15524		0.11221	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

JRS

RETIREMENT RATES: The following rates of retirement are assumed for members eligible to retire.

JRS Rates of Retirement								
Age	Service Multiplier = 1.5				Service Multiplier = 2.0			
	Years of Service				Years of Service			
	<=1	2 - 19	20	>=21	<=1	2 - 14	15	>=16
<=59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50
61	0.00	0.00	0.50	0.15	0.00	0.00	0.50	0.15
62	0.00	0.00	0.50	0.15	0.00	0.00	0.50	0.15
63	0.00	0.00	0.50	0.15	0.00	0.00	0.50	0.15
64	0.00	0.00	0.50	0.15	0.00	0.00	0.50	0.15
65	0.00	0.50	0.50	0.15	0.00	0.50	0.50	0.15
66	0.00	0.15	0.15	0.15	0.00	0.15	0.15	0.15
67	0.00	0.15	0.15	0.15	0.00	0.15	0.15	0.15
68	0.00	0.15	0.15	0.15	0.00	0.15	0.15	0.15
69	0.00	0.15	0.15	0.15	0.00	0.15	0.15	0.15
>=70	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00

JRS Rates of Retirement								
Age	Service Multiplier = 2.5				Service Multiplier = 3.5			
	Years of Service				Years of Service			
	<=1	2 - 11	12	>=13	<1	1 - 8	9	>=10
<=59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50
61	0.00	0.00	0.50	0.15	0.00	0.00	0.50	0.15
62	0.00	0.00	0.50	0.15	0.00	0.00	0.50	0.15
63	0.00	0.00	0.50	0.15	0.00	0.00	0.50	0.15
64	0.00	0.00	0.50	0.15	0.00	0.00	0.50	0.15
65	0.00	0.50	0.50	0.15	0.00	0.50	0.50	0.15
66	0.00	0.15	0.15	0.15	0.00	0.15	0.15	0.15
67	0.00	0.15	0.15	0.15	0.00	0.15	0.15	0.15
68	0.00	0.15	0.15	0.15	0.00	0.15	0.15	0.15
69	0.00	0.15	0.15	0.15	0.00	0.15	0.15	0.15
>=70	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

JRS

DISABILITY RATES: As shown below for selected ages.

JRS Rates of Disability		
Age	Male	Female
<=29	0.00000	0.00000
30	0.00007	0.00007
35	0.00037	0.00045
40	0.00142	0.00090
45	0.00292	0.00210
50	0.00480	0.00397
55	0.00712	0.00600
>=60	0.00000	0.00000

TERMINATION RATES: There are no assumed rates of withdrawal prior to service retirement (For causes other than death, disability, or retirement).

SALARY INCREASE RATES: Salary increase rates are 4.50%.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

NORMAL RETIREMENT ELIGIBILITY:

A member may retire upon Normal Retirement on or after age 60 with credit for five years of service.

EARLY RETIREMENT ELIGIBILITY:

A member may retire early after reaching age 50 with at least five years of service credit.

DISABILITY – NON-VSDP:

A member hired prior to 1/1/1999 and who has declined VSDP coverage is eligible for disability retirement benefits from the first day of employment.

DISABILITY – VSDP:

A Plan 1 Member hired prior to January 1, 1999 and who has elected VSDP coverage or any member hired on or after January 1, 1999. Applicable members hired prior to July 1, 2009 are eligible from the first day of employment for work related and non-work related VSDP disability benefits. Applicable members hired on or after July 1, 2009 are eligible from the first day of employment for work-related VSDP disability benefits, but must have a minimum of one year of service to be eligible for non-work related VSDP disability benefits.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 5 years and Females set back 3 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Females set back 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00031	0.00024	0.00000	0.00014	0.00014	0.00000
25	0.00040	0.00031	0.02257	0.00014	0.00015	0.00745
30	0.00070	0.00040	0.02257	0.00018	0.00020	0.00745
35	0.00092	0.00070	0.02257	0.00030	0.00036	0.00745
40	0.00116	0.00092	0.02257	0.00043	0.00048	0.00745
45	0.00149	0.00116	0.02257	0.00063	0.00076	0.00745
50	0.00206	0.00149	0.02512	0.00092	0.00108	0.01154
55	0.00353	0.00247	0.03156	0.00148	0.00198	0.01654
60	0.00571	0.00489	0.03803	0.00272	0.00402	0.02184
65	0.00000	0.00961	0.04498	0.00000	0.00780	0.02803
70	0.00000	0.01641	0.05445	0.00000	0.01344	0.03764
75		0.02854	0.06941		0.02212	0.05223
80		0.05265	0.09215		0.03607	0.07231
85		0.09624	0.12188		0.06041	0.10020
90		0.16928	0.15524		0.11221	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

RETIREMENT RATES: The following rates of retirement are assumed for members eligible to retire.

VaLORS Rates of Retirement		
Age	Years of Service	
	Less Than 25	25 or More
<=49	0.000	0.000
50	0.092	0.250
51	0.090	0.250
52	0.090	0.250
53	0.090	0.250
54	0.100	0.250
55	0.095	0.250
56	0.090	0.250
57	0.120	0.300
58	0.100	0.300
59	0.120	0.400
60	0.200	0.400
61	0.260	0.500
62	0.400	1.000
63	0.200	1.000
64	0.200	1.000
>=65	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

DISABILITY RATES: As shown below for selected ages. 50% of disabilities are assumed to be service related.

VaLORS Rates of Disability	
Age	Unisex
20	0.00150
25	0.00300
30	0.00600
35	0.00800
40	0.00800
45	0.01000
50	0.01200
55	0.01200
60	0.01000
65	0.00000
70	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

TERMINATION RATES: The following withdrawal rates are used based on age and service. (For causes other than death, disability, or retirement)

VaLORS Rates of Termination						
Age	Males			Females		
	Years of Service					
	0-2	3-9	>=10	0-2	3-9	>=10
20	0.250	0.150	0.050	0.200	0.150	0.075
25	0.200	0.150	0.050	0.200	0.150	0.075
30	0.200	0.125	0.050	0.200	0.125	0.060
35	0.200	0.125	0.050	0.200	0.125	0.060
40	0.150	0.105	0.040	0.175	0.105	0.050
45	0.150	0.105	0.040	0.175	0.080	0.040
50	0.150	0.080	0.040	0.175	0.080	0.040
55	0.120	0.065	0.040	0.100	0.120	0.040
60	0.125	0.070	0.040	0.100	0.200	0.040
65	0.150	0.070	0.040	0.100	0.100	0.040
70	0.200	0.070	0.040	0.100	0.100	0.040



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

SALARY INCREASE RATES: The following total salary increase rates are used. The total salary increase rate consists of an inflation rate of 2.50%, a productivity component of 1.00%, and a variable merit component that is dependent on years of service.

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1 - 4	4.75%
5	4.65
6 - 9	4.40
10 - 19	4.00
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with General Employee Pension Benefit Coverage

NORMAL RETIREMENT ELIGIBILITY:

Plan 1 Members (Members hired prior to July 1, 2010 and who were vested as of January 1, 2013):

A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service.

Plan 2 Members (Members hired on or after July 1, 2010, or members hired prior to July 1, 2010 and who were not vested as of January 1, 2013):

A member may retire with unreduced pension benefits upon Normal Retirement once they attain their normal Social Security retirement age and have at least five years of service.

EARLY RETIREMENT ELIGIBILITY:

Plan 1 Members:

A member may retire early with unreduced pension benefits after reaching age 50 with at least 30 years service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.

Plan 2 Members:

A member may retire early with unreduced pension benefits upon the sum of their age and their service being 90 (Rule of 90). A member may retire early with reduced pension benefits after reaching age 60 with at least five years of service credit.

DISABILITY:

A member is eligible for disability retirement benefits from the first day of employment.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with General Employee Pension Benefit Coverage

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 4 years and Females set back 2 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Males set forward 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00029	0.00025	0.00000	0.00014	0.00014	0.00000
25	0.00037	0.00034	0.02257	0.00014	0.00016	0.00745
30	0.00064	0.00045	0.02257	0.00019	0.00022	0.00745
35	0.00089	0.00076	0.02257	0.00033	0.00038	0.00745
40	0.00110	0.00095	0.02257	0.00045	0.00052	0.00745
45	0.00142	0.00122	0.02257	0.00069	0.00081	0.00745
50	0.00188	0.00167	0.02512	0.00100	0.00119	0.01154
55	0.00320	0.00292	0.03156	0.00168	0.00231	0.01654
60	0.00530	0.00567	0.03803	0.00298	0.00457	0.02184
65	0.00717	0.01109	0.04498	0.00456	0.00878	0.02803
70	0.00000	0.01816	0.05445	0.00000	0.01515	0.03764
75		0.03181	0.06941		0.02394	0.05223
80		0.06013	0.09215		0.03987	0.07231
85		0.10670	0.12188		0.06866	0.10020
90		0.18438	0.15524		0.12400	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with General Employee Pension Benefit Coverage

RETIREMENT RATES:

Plan 1 Members: The following rates of retirement are assumed for members eligible to retire.

Group A General Employee Rates of Retirement, Plan 1				
Age	Male		Female	
	Reduced Retirement	Unreduced Retirement	Reduced Retirement	Unreduced Retirement
<=49	0.000	0.000	0.000	0.000
50	0.035	0.130	0.035	0.156
51	0.035	0.125	0.035	0.122
52	0.035	0.090	0.030	0.109
53	0.035	0.104	0.040	0.113
54	0.035	0.108	0.035	0.104
55	0.050	0.115	0.050	0.143
56	0.055	0.130	0.050	0.108
57	0.049	0.130	0.050	0.117
58	0.045	0.120	0.050	0.140
59	0.045	0.135	0.060	0.134
60	0.060	0.170	0.075	0.128
61	0.105	0.190	0.100	0.177
62	0.175	0.310	0.155	0.280
63	0.130	0.210	0.135	0.277
64	0.165	0.290	0.170	0.183
65	0.300	0.410	0.300	0.296
66	0.300	0.275	0.300	0.311
67	0.300	0.240	0.300	0.332
68	0.300	0.210	0.300	0.325
69	0.300	0.100	0.300	0.225
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with General Employee Pension Benefit Coverage

RETIREMENT RATES:

Plan 2 Members: The following rates of retirement are assumed for members eligible to retire.

Group A General Employee Rates of Retirement, Plan 2				
Age	Male		Female	
	Reduced Retirement	Unreduced Retirement	Reduced Retirement	Unreduced Retirement
<=49	0.000	0.000	0.000	0.000
50	0.000	0.130	0.000	0.156
51	0.000	0.125	0.000	0.122
52	0.000	0.090	0.000	0.109
53	0.000	0.104	0.000	0.113
54	0.000	0.108	0.000	0.104
55	0.000	0.115	0.000	0.143
56	0.000	0.130	0.000	0.108
57	0.000	0.130	0.000	0.117
58	0.000	0.120	0.000	0.140
59	0.000	0.135	0.000	0.134
60	0.060	0.170	0.075	0.128
61	0.105	0.190	0.100	0.177
62	0.175	0.310	0.155	0.280
63	0.130	0.210	0.135	0.277
64	0.165	0.290	0.170	0.183
65	0.300	0.410	0.300	0.296
66	0.300	0.275	0.300	0.311
67	0.300	0.240	0.300	0.332
68	0.300	0.210	0.300	0.325
69	0.300	0.100	0.300	0.225
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with General Employee Pension Benefit Coverage

DISABILITY RATES: As shown below for selected ages.

Group A General Employees Rates of Disability		
Age	Male	Female
20	0.00000	0.00000
25	0.00060	0.00000
30	0.00060	0.00045
35	0.00060	0.00045
40	0.00180	0.00045
45	0.00180	0.00090
50	0.00240	0.00180
55	0.00480	0.00315
60	0.00720	0.00450
65	0.00540	0.00315
70	0.00000	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with General Employee Pension Benefit Coverage

TERMINATION RATES:

Plan 1 Members: The following withdrawal rates are used based on age and years of service.
(For causes other than death, disability, or retirement)

Male Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.218	0.137	0.000
30	0.185	0.112	0.029
35	0.172	0.097	0.058
40	0.147	0.080	0.037
45	0.143	0.071	0.029
50	0.128	0.060	0.025
55	0.109	0.053	0.007
60	0.126	0.067	0.006
65	0.136	0.082	0.000

Female Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.233	0.167	0.000
30	0.213	0.141	0.074
35	0.186	0.106	0.051
40	0.160	0.093	0.039
45	0.148	0.077	0.028
50	0.130	0.064	0.026
55	0.119	0.063	0.000
60	0.135	0.062	0.000
65	0.126	0.082	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with General Employee Pension Benefit Coverage

TERMINATION RATES:

Plan 2 Members: The following withdrawal rates are used based on age and years of service.
(For causes other than death, disability, or retirement)

Male Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.218	0.137	0.000
30	0.185	0.112	0.029
35	0.172	0.097	0.058
40	0.147	0.080	0.037
45	0.143	0.071	0.029
50	0.128	0.060	0.025
55	0.109	0.053	0.007
60	0.126	0.067	0.000
65	0.136	0.082	0.000

Female Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.233	0.167	0.000
30	0.213	0.141	0.074
35	0.186	0.106	0.051
40	0.160	0.093	0.039
45	0.148	0.077	0.028
50	0.130	0.064	0.026
55	0.119	0.063	0.000
60	0.135	0.062	0.000
65	0.126	0.082	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with General Employee Pension Benefit Coverage

SALARY INCREASE RATES: The following salary increase rates are used. Inflation rate of 2.50% plus productivity component of 1.00% plus step-rate/promotional component as shown:

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1 – 2	5.35%
3	4.75
4 - 6	4.45
7	4.35
8	4.25
9 - 10	4.00
11 - 19	3.65
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

NORMAL RETIREMENT ELIGIBILITY:

A member may retire with an unreduced pension benefit upon Normal Retirement on or after age 60 with credit for five years of service.

EARLY RETIREMENT ELIGIBILITY:

A member may retire early with a reduced pension benefit after reaching age 50 with at least five years of service credit.

DISABILITY:

A member is eligible for disability retirement benefits from the first day of employment.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set back 2 years and Females set back 2 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Males set forward 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00022	0.00025	0.00000	0.00014	0.00014	0.00000
25	0.00028	0.00034	0.02257	0.00014	0.00016	0.00745
30	0.00036	0.00045	0.02257	0.00019	0.00022	0.00745
35	0.00057	0.00076	0.02257	0.00033	0.00038	0.00745
40	0.00086	0.00095	0.02257	0.00045	0.00052	0.00745
45	0.00104	0.00122	0.02257	0.00069	0.00081	0.00745
50	0.00135	0.00167	0.02512	0.00100	0.00119	0.01154
55	0.00175	0.00292	0.03156	0.00168	0.00231	0.01654
60	0.00290	0.00567	0.03803	0.00298	0.00457	0.02184
65	0.00000	0.01109	0.04498	0.00000	0.00878	0.02803
70	0.00000	0.01816	0.05445	0.00000	0.01515	0.03764
75		0.03181	0.06941		0.02394	0.05223
80		0.06013	0.09215		0.03987	0.07231
85		0.10670	0.12188		0.06866	0.10020
90		0.18438	0.15524		0.12400	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

POLITICAL SUBDIVISIONS

GROUP A

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

RETIREMENT RATES: The following rates of retirement are assumed for members eligible to retire.

Group A LEOs/Fire Rates of Retirement		
Age	Unisex	
	Reduced Retirement	Unreduced Retirement
<=49	0.000	0.000
50	0.090	0.250
51	0.085	0.155
52	0.085	0.145
53	0.085	0.165
54	0.085	0.130
55	0.085	0.180
56	0.085	0.240
57	0.085	0.210
58	0.100	0.240
59	0.135	0.315
60	0.200	0.350
61	0.250	0.350
62	0.300	0.500
63	0.300	0.500
64	0.400	0.500
>=65	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

POLITICAL SUBDIVISIONS

GROUP A

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

DISABILITY RATES: As shown below for selected ages.

Group A LEOs/Fire Rates of Disability		
Age	Male	Female
20	0.00000	0.00000
25	0.00008	0.00000
30	0.00050	0.00050
35	0.00100	0.00110
40	0.00180	0.00240
45	0.00275	0.00350
50	0.00400	0.00530
55	0.00550	0.00740
60	0.00650	0.00810
65	0.00000	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

TERMINATION RATES: The following withdrawal rates are used based on age and years of service. (For causes other than death, disability, or retirement)

Group A LEOs/Fire Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.078	0.068	0.000
30	0.082	0.056	0.021
35	0.080	0.044	0.024
40	0.074	0.043	0.017
45	0.092	0.046	0.015
50	0.093	0.045	0.028
55	0.083	0.063	0.000
60	0.087	0.065	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP A**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

SALARY INCREASE RATES: The following salary increase rates are used. Inflation rate of 2.50% plus productivity component of 1.00% plus step-rate/promotional component as shown:

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1 – 4	4.75%
5	4.65
6 – 9	4.40
10 - 19	4.00
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B***

Assumptions for Participants with General Employee Pension Benefit Coverage

NORMAL RETIREMENT ELIGIBILITY:

Plan 1 Members (Members hired prior to July 1, 2010 and who were vested as of January 1, 2013):

A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service.

Plan 2 Members (Members hired on or after July 1, 2010, or members hired prior to July 1, 2010 and who were not vested as of January 1, 2013):

A member may retire with unreduced pension benefits upon Normal Retirement once they attain their normal Social Security retirement age and have at least five years of service.

EARLY RETIREMENT ELIGIBILITY:

Plan 1 Members:

A member may retire early with unreduced pension benefits after reaching age 50 with at least 30 years service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.

Plan 2 Members:

A member may retire early with unreduced pension benefits upon the sum of their age and their service being 90 (Rule of 90). A member may retire early with reduced pension benefits after reaching age 60 with at least five years of service credit.

DISABILITY:

A member is eligible for disability retirement benefits from the first day of employment.

*The actuarial assumptions for Political Subdivisions Group B are also applied to members of the political subdivisions not providing VRS pension benefits.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with General Employee Pension Benefit Coverage

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 4 years and Females set back 2 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Males set forward 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00029	0.00025	0.00000	0.00014	0.00014	0.00000
25	0.00037	0.00034	0.02257	0.00014	0.00016	0.00745
30	0.00064	0.00045	0.02257	0.00019	0.00022	0.00745
35	0.00089	0.00076	0.02257	0.00033	0.00038	0.00745
40	0.00110	0.00095	0.02257	0.00045	0.00052	0.00745
45	0.00142	0.00122	0.02257	0.00069	0.00081	0.00745
50	0.00188	0.00167	0.02512	0.00100	0.00119	0.01154
55	0.00320	0.00292	0.03156	0.00168	0.00231	0.01654
60	0.00530	0.00567	0.03803	0.00298	0.00457	0.02184
65	0.00717	0.01109	0.04498	0.00456	0.00878	0.02803
70	0.00000	0.01816	0.05445	0.00000	0.01515	0.03764
75		0.03181	0.06941		0.02394	0.05223
80		0.06013	0.09215		0.03987	0.07231
85		0.10670	0.12188		0.06866	0.10020
90		0.18438	0.15524		0.12400	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with General Employee Pension Benefit Coverage

RETIREMENT RATES:

Plan 1 Members: The following rates of retirement are assumed for members eligible to retire.

Group B General Employees Rates of Retirement, Plan 1				
Age	Male		Female	
	Reduced Retirement	Unreduced Retirement	Reduced Retirement	Unreduced Retirement
<=49	0.000	0.000	0.000	0.000
50	0.050	0.090	0.040	0.080
51	0.050	0.090	0.045	0.080
52	0.050	0.070	0.045	0.080
53	0.050	0.070	0.045	0.080
54	0.050	0.100	0.045	0.100
55	0.050	0.140	0.055	0.115
56	0.060	0.140	0.050	0.115
57	0.060	0.100	0.050	0.125
58	0.060	0.110	0.050	0.130
59	0.060	0.110	0.050	0.115
60	0.060	0.110	0.075	0.130
61	0.100	0.250	0.075	0.175
62	0.170	0.350	0.170	0.250
63	0.150	0.250	0.130	0.250
64	0.150	0.270	0.130	0.175
65	0.300	0.330	0.300	0.400
66	0.300	0.330	0.300	0.400
67	0.300	0.200	0.300	0.250
68	0.300	0.200	0.300	0.250
69	0.300	0.200	0.300	0.250
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with General Employee Pension Benefit Coverage

RETIREMENT RATES:

Plan 2 Members: The following rates of retirement are assumed for members eligible to retire.

Group B General Employees Rates of Retirement, Plan 2				
Age	Male		Female	
	Reduced Retirement	Unreduced Retirement	Reduced Retirement	Unreduced Retirement
<=49	0.000	0.000	0.000	0.000
50	0.000	0.090	0.000	0.080
51	0.000	0.090	0.000	0.080
52	0.000	0.070	0.000	0.080
53	0.000	0.070	0.000	0.080
54	0.000	0.100	0.000	0.100
55	0.000	0.140	0.000	0.115
56	0.000	0.140	0.000	0.115
57	0.000	0.100	0.000	0.125
58	0.000	0.110	0.000	0.130
59	0.000	0.110	0.000	0.115
60	0.060	0.110	0.075	0.130
61	0.100	0.250	0.075	0.175
62	0.170	0.350	0.170	0.250
63	0.150	0.250	0.130	0.250
64	0.150	0.250	0.130	0.250
65	0.300	0.250	0.300	0.250
66	0.300	0.270	0.300	0.175
67	0.300	0.330	0.300	0.400
68	0.300	0.330	0.300	0.400
69	0.300	0.200	0.300	0.250
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

POLITICAL SUBDIVISIONS

GROUP B

Assumptions for Participants with General Employee Pension Benefit Coverage

DISABILITY RATES: As shown for selected ages.

Group B General Employees Rates of Disability		
Age	Male	Female
20	0.00018	0.00006
25	0.00012	0.00006
30	0.00060	0.00024
35	0.00114	0.00048
40	0.00144	0.00126
45	0.00186	0.00270
50	0.00312	0.00450
55	0.00510	0.00696
60	0.00816	0.00552
65	0.00558	0.00270
70	0.00000	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with General Employee Pension Benefit Coverage

TERMINATION RATES: The following withdrawal rates are used based on age and years of service. (For causes other than death, disability, or retirement)

Male Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.235	0.140	0.000
30	0.210	0.125	0.060
35	0.185	0.105	0.055
40	0.165	0.090	0.040
45	0.155	0.080	0.030
50	0.130	0.065	0.025
55	0.120	0.065	0.010
60	0.120	0.070	0.010
65	0.120	0.080	0.000

Female Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.255	0.165	0.000
30	0.220	0.140	0.060
35	0.190	0.115	0.060
40	0.165	0.100	0.045
45	0.150	0.080	0.035
50	0.135	0.070	0.030
55	0.125	0.065	0.000
60	0.120	0.070	0.000
65	0.130	0.090	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with General Employee Pension Benefit Coverage

SALARY INCREASE RATES: The following salary increase rates are used. Inflation rate of 2.50% plus productivity component of 1.00% plus step-rate/promotional component as shown:

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1 – 2	5.35%
3	4.75
4 – 6	4.45
7	4.35
8	4.25
9 - 10	4.00
10 - 19	3.65
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

NORMAL RETIREMENT ELIGIBILITY:

A member may retire with an unreduced pension benefit upon Normal Retirement on or after age 60 with credit for five years of service.

EARLY RETIREMENT ELIGIBILITY:

A member may retire early with a reduced pension benefit after reaching age 50 with at least five years of service credit.

DISABILITY:

A member is eligible for disability retirement benefits from the first day of employment.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

MORTALITY RATES:

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set back 2 years and Females set back 2 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Males set forward 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00022	0.00025	0.00000	0.00014	0.00014	0.00000
25	0.00028	0.00034	0.02257	0.00014	0.00016	0.00745
30	0.00036	0.00045	0.02257	0.00019	0.00022	0.00745
35	0.00057	0.00076	0.02257	0.00033	0.00038	0.00745
40	0.00086	0.00095	0.02257	0.00045	0.00052	0.00745
45	0.00104	0.00122	0.02257	0.00069	0.00081	0.00745
50	0.00135	0.00167	0.02512	0.00100	0.00119	0.01154
55	0.00175	0.00292	0.03156	0.00168	0.00231	0.01654
60	0.00290	0.00567	0.03803	0.00298	0.00457	0.02184
65	0.00000	0.01109	0.04498	0.00000	0.00878	0.02803
70	0.00000	0.01816	0.05445	0.00000	0.01515	0.03764
75		0.03181	0.06941		0.02394	0.05223
80		0.06013	0.09215		0.03987	0.07231
85		0.10670	0.12188		0.06866	0.10020
90		0.18438	0.15524		0.12400	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

POLITICAL SUBDIVISIONS

GROUP B

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

RETIREMENT RATES: The following rates of retirement are assumed for members eligible to retire.

Group B LEOs/Fire Rates of Retirement		
Age	Unisex	
	Reduced Retirement	Unreduced Retirement
<=49	0.000	0.000
50	0.085	0.250
51	0.090	0.140
52	0.070	0.120
53	0.080	0.120
54	0.080	0.105
55	0.085	0.175
56	0.085	0.165
57	0.085	0.185
58	0.095	0.190
59	0.115	0.285
60	0.200	0.350
61	0.250	0.350
62	0.300	0.500
63	0.300	0.500
64	0.400	0.500
>=65	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

DISABILITY RATES: As shown below for selected ages. 60% of disabled cases are assumed to be service related.

Group B LEOs/Fire Rates of Disability	
Age	Unisex
20	0.00000
25	0.00000
30	0.00030
35	0.00068
40	0.00113
45	0.00285
50	0.00383
55	0.00480
60	0.00638
65	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

TERMINATION RATES: The following withdrawal rates are used based on age and years of service. (For causes other than death, disability, or retirement)

Male Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.130	0.085	0.000
30	0.110	0.075	0.050
35	0.110	0.070	0.038
40	0.100	0.060	0.028
45	0.130	0.060	0.024
50	0.110	0.060	0.032
55	0.150	0.080	0.005
60	0.110	0.100	0.005
65	0.220	0.108	0.050

Female Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.130	0.100	0.000
30	0.120	0.080	0.045
35	0.140	0.080	0.045
40	0.140	0.070	0.035
45	0.120	0.060	0.035
50	0.120	0.060	0.035
55	0.120	0.050	0.005
60	0.120	0.050	0.005
65	0.224	0.108	0.050



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

**POLITICAL SUBDIVISIONS
GROUP B**

Assumptions for Participants with LEOs/Fire Pension Benefit Coverage

SALARY INCREASE RATES: The following salary increase rates are used. Inflation rate of 2.50% plus productivity component of 1.00% plus step-rate/promotional component as shown:

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1 – 4	4.75%
5	4.65
6 – 9	4.40
10 - 19	4.00
20 or more	3.50



Schedule D – Actuarial Cost Method

1. The valuation is prepared on the projected benefit basis, which is used to determine the present value of each member's expected benefit payable upon death after retirement or disability. The calculations are based on the member's age, years of service, gender, and an assumed future interest earnings rate (currently 7.00%). The calculations consider the probability of a member's death or termination of employment prior to becoming eligible for a benefit and the probability of the member terminating with a service or disability benefit. The present value of the expected benefits payable to active members is added to the present value of the expected future payments to current benefit recipients to obtain the present value of all expected benefits payable to the present group of members.
2. The employer contributions required to support the benefits of the Group Life Insurance Program are determined following a level funding approach, and consist of a normal contribution and an accrued liability contribution.
3. The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required to meet the cost of all benefits payable on a member's behalf.
4. The unfunded accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions from the present value of expected benefits to be paid from the Group Life Insurance Program. The accrued liability contribution amortizes the balance of the unfunded accrued liability over a period of years from the valuation date.



Schedule E – Summary of Main Plan Provisions as Interpreted for Valuation Purposes

The Group Life Insurance Program is administered by the Board of Trustees for the Virginia Retirement System (VRS). Contributions received are held in trust. Premiums for active employees are paid to Minnesota Life which in turn pays the life insurance proceeds to the beneficiaries. Benefit payments for post-employment benefits are made by Minnesota Life and reimbursed by the Trust. The Board sets administrative policy and determines the allocation of the assets held for investment.

The following persons are eligible to participate in the group life insurance program: Teachers, State Employees, State Police (SPORS), Judicial Employees (JRS), Virginia Law Officers (VaLORS) and those VRS members receiving long-term disability benefits from the Virginia Sickness and Disability Program. In addition, local political subdivisions may elect coverage. Substantially all local units covered by VRS have elected coverage in the Group Life Insurance Program, as have other political subdivisions not providing VRS pension benefits. Also, certain members of the Optional Retirement Plan (ORP) have life insurance coverage. Although certain members who were employed at the time of initial coverage under the Group Life Insurance Program may decline coverage, substantially all full-time, permanent employees participate.

Each active member is entitled to a death benefit from this program equal to two times the member's annual rate of compensation, rounded up to the next higher multiple of \$1,000. This benefit is provided for by the purchase of a group term life insurance contract from an insurance company. Active members may also be covered by Accidental Death and Dismemberment insurance, and they may elect additional amounts of insurance. These benefits are excluded from this valuation.

Each service retiree will be entitled to a death benefit from this program equal to the amount in effect immediately before his/her termination or retirement, reduced by 25% on January 1 of the first full year following the date the employee is separated from service and each year thereafter. In no event will the death benefit be less than 25% of the amount in effect at the date of termination or retirement.

Each disabled member, including those receiving benefits from VSDP, will be entitled to a death benefit from this program, similar to the service retiree benefit, except the 25% per year reduction does not begin until the member reaches Normal Retirement Age, or the retirement date, if later. VaLORS, SPORS, and State employees participating in VSDP and hired on or after July 1, 2009 need at least one year of service before the employee is eligible for a non-service related life insurance benefit from VSDP.

The post-employment death benefit is paid for by an addition to the contribution required to provide the active member benefit. While the active member portion of the contribution is used to purchase group term life insurance from an insurance company, the post-employment portion of the contribution is held in a trust until required to pay benefits. The post-employment contribution is actuarially determined by this valuation.



Schedule F – Schedule of Active Member Data

**SCHEDULE OF ACTIVE MEMBER DATA
AS OF JUNE 30, 2013**

Attained Age	Years of Service to Valuation Date									Total
	Less than 1 Year	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 or more	
Under 25	2,698	4,577	69							7,344
25 - 29	3,925	18,923	6,790	35						29,673
30 - 34	2,764	11,816	18,822	4,174	32					37,608
35 - 39	2,050	8,609	12,808	11,591	2,636	24				37,718
40 - 44	1,891	8,748	12,492	10,805	9,506	2,471	69			45,982
45 - 49	1,712	7,701	12,019	9,653	7,309	7,474	3,043	61		48,972
50 - 54	1,389	6,384	11,211	10,153	6,905	6,500	7,386	2,815	127	52,870
55 - 59	978	4,641	8,541	8,492	6,736	6,136	5,707	5,555	2,627	49,413
60 - 64	479	2,511	5,488	5,801	4,987	4,911	4,295	2,791	3,968	35,231
65 - 69	142	849	2,041	2,124	1,732	1,713	1,491	907	1,490	12,489
70 & Up	46	279	699	705	493	452	361	231	514	3,780
Totals	18,074	75,038	90,980	63,533	40,336	29,681	22,352	12,360	8,726	361,080