

# Legislative Retirement System of North Carolina

Report on the Actuarial Valuation  
Prepared as of December 31, 2013

October 2014



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October 6, 2014

Board of Trustees  
Legislative Retirement  
System of North Carolina  
325 North Salisbury Street  
Raleigh, NC 27603

Members of the Board:

We submit herewith our report on the actuarial valuation of the Legislative Retirement System of North Carolina (referred to as "LRS" or the "Legislative Plan") prepared as of December 31, 2013. The report has been prepared in accordance with North Carolina General Statute 120-4.

The primary purpose of the valuation report is to determine the required employer contribution rates, to describe the current financial condition of LRS, and to analyze changes in such condition. In addition, the report provides information that the Office of the State Controller (OSC) requires for its Comprehensive Annual Financial Report (CAFR) and it summarizes census data. Use of this report for any other purposes or by anyone other than OSC and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Buck Consultants' written consent.


The valuation is based upon membership data and financial information as furnished by the Retirement Systems Division and the Financial Operations Division and as summarized in this report. Although reviewed for reasonableness and consistency with the prior valuation, these elements have not been audited by Buck and we cannot certify as to the accuracy and completeness of the data supplied. The valuation is also based on benefit and contribution provisions as presented in this report. If you have reason to believe that the plan provisions are incorrectly described, that important plan provisions relevant to this valuation are not described, or that conditions have changed since the calculations were made, you should contact the authors of this actuarial report prior to relying on this information.

The valuation is further based on the actuarial valuation assumptions, approved by the Board of Trustees, as presented in this report. We believe that these assumptions are reasonable and comply with the requirements of GASB Nos. 25, 27, and 67. We prepared this report in accordance with the requirements of these standards.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. Because of limited scope, Buck performed no analysis of the potential range of such future differences.

The undersigned 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,

  
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Principal, Consulting Actuary

  
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Principal, Consulting Actuary

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# Executive Summary

## Overview

The North Carolina Retirement Systems Division (RSD) was established in 1941 to provide retirement benefits for public servants in the State of North Carolina. Today, under the management of the Department of State Treasurer, RSD administers eight public pension plans (defined benefit plans), three supplemental retirement plans (voluntary defined contributions plans), a health trust fund, a disability income plan, death benefit funds and a number of other benefit programs. As of December 31, 2013, the Retirement Systems defined benefit plans cover about 900,000 current and prior public servants in the state of North Carolina. During the fiscal year ending June 30, 2014, the Systems paid \$5.2 billion in pensions to about 250,000 retirees. And as of June 30, 2014, the Systems' assets were valued at \$90 billion.

Under the supplemental retirement plans, the amount of contributions in any given year is defined by law. The amount of benefits derived is dependent on the investment returns the individual achieves. Conversely, under the pension plans, the amount of the benefit paid to a member upon retirement, termination, death or disability is defined by law. The amount of contributions needed to fund these benefits cannot be known with certainty. In North Carolina, like other states, these contributions are paid during a public servant's career so that upon retirement, termination, death, or disability, there are funds available to pay these benefits. These amounts are determined through an actuarial valuation. Actuarial valuations are performed for each of the pension plans administered by RSD and the results are contained in actuarial valuation reports like this.

The Legislative Retirement System (referred to as "LRS" or the "Legislative Plan") provides benefits to all members of the General Assembly. LRS has almost \$30 million in assets and over 500 members. This actuarial valuation report is our annual analysis of the financial health of LRS. This report, prepared as of December 31, 2013, presents the results of the actuarial valuation of LRS.

## Purpose

An actuarial valuation is performed on LRS annually as of the end of the calendar year. The actuary determines the amount of contributions to be made to LRS during each member's career that, when combined with investment return, will be sufficient to pay for retirement benefits.

In addition, the annual actuarial valuation is performed to:

- Determine the progress on funding LRS,
- Explore why the results of the current valuation differ from the results of the valuation of the previous year, and
- Satisfy regulatory and accounting requirements.

A detailed summary of the valuation process and a glossary of actuarial terms are provided in Appendix A.

# Executive Summary

## Key Takeaways

The actuarial valuation is performed each year to replace the estimates the actuary assumed for the prior valuation with the actual events that happened. This past year, as expected, some of the assumptions used in the prior valuation were not realized. Key results of the December 31, 2013 valuation as compared to the December 31, 2012 valuation were:

- Market value returns of 12.2% compared to 7.25% assumed
- Increase in covered payroll of 2.0% compared to 3% assumed increase
- Unexpected increase in liabilities due to more retirements than assumed
- Recent legislation signed into law including:
  - 1% cost-of-living adjustment
  - Return of contributions with interest to all members who terminate prior to meeting vesting requirements
- No significant changes in actuarial assumptions or funding methodology from the prior year's valuations

When compared to the December 31, 2012 valuation, the above resulted in:

- A lower funded ratio due to more retirements than assumed (119.4% in the December 31, 2013 valuation compared to 123.3% in the December 31, 2012 valuation)
- An employer required contribution rate greater than zero (1.80% for fiscal year ending June 30, 2016 compared to 0.00% for fiscal year ending June 30, 2015)
- Lower projected benefit amounts being accrued by active members

LRS is well funded compared to its peers. This is due to:

- Stakeholders working together to keep LRS well-funded since inception
- A history of appropriating and contributing the recommended contribution requirements
- Assumptions that in aggregate are more conservative than peers
- A funding policy that aggressively pays down unfunded liability over an 8-year period
- An ad hoc cost-of-living adjustment that supports the health of the system
- Modest changes in benefits when compared to peers

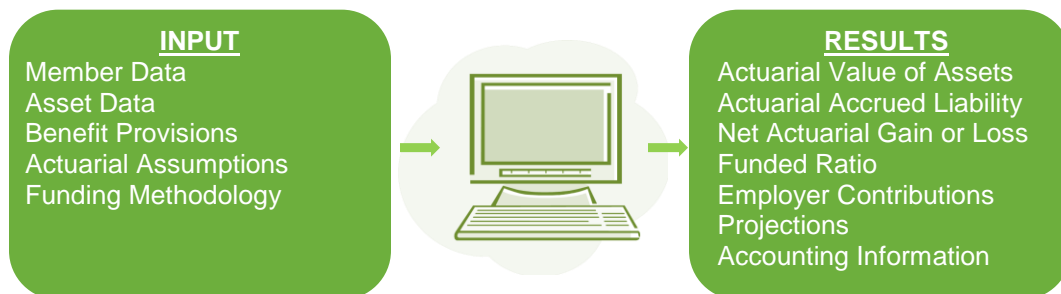
Continued focus on these measures will be needed to maintain the solid status of LRS well into the future.

More details can be found later in this report. We encourage readers to start with Section 1 and refer to other sections for additional details as needed.



## Section 1: The Valuation Process

The following diagram summarizes the inputs and results of the actuarial valuation process.



A more detailed description of the valuation process is provided in Appendix A.

### Valuation Input: Membership Data

As with any estimate, the actuary collects information that we know now. Under the actuarial valuation process, current information about LRS members is collected annually by the Retirement Systems Division staff at the direction of the actuary. Membership data will assist the actuary in estimating benefits that could be paid in the future. Information about benefit provisions and assets held in the trust as of the valuation date is also collected.

The member information the actuary collects includes data elements such as current service, salary and benefit group identifier for members that have not separated service, and actual benefit amounts and form of payment for members that have separated service. Data elements such as gender and date of birth are used to determine when a benefit might be paid and for how long.

## Section 1: The Valuation Process

### Valuation Input: Membership Data (continued)

The table below provides a summary of the membership data used in this valuation compared to the prior valuation.

Number as of	12/31/2013	12/31/2012
Active members	170	169
Terminated members and survivors of deceased members entitled to benefits but not yet receiving benefits	94	81
Retired members and survivors of deceased members currently receiving benefits	<u>311</u>	<u>283</u>
Total	575	533
Active Reported Compensation	3,579,277	3,510,220
Active Valuation Compensation	3,743,644	3,740,429
Annual Retirement Allowances	2,436,106	2,079,757

**Commentary:** Overall, the active membership has remained relatively stable. The number of retired members and survivors of deceased members currently receiving benefits increased by 9.9% from the previous valuation date. The increase in retiree population reflects more retirements than assumed.

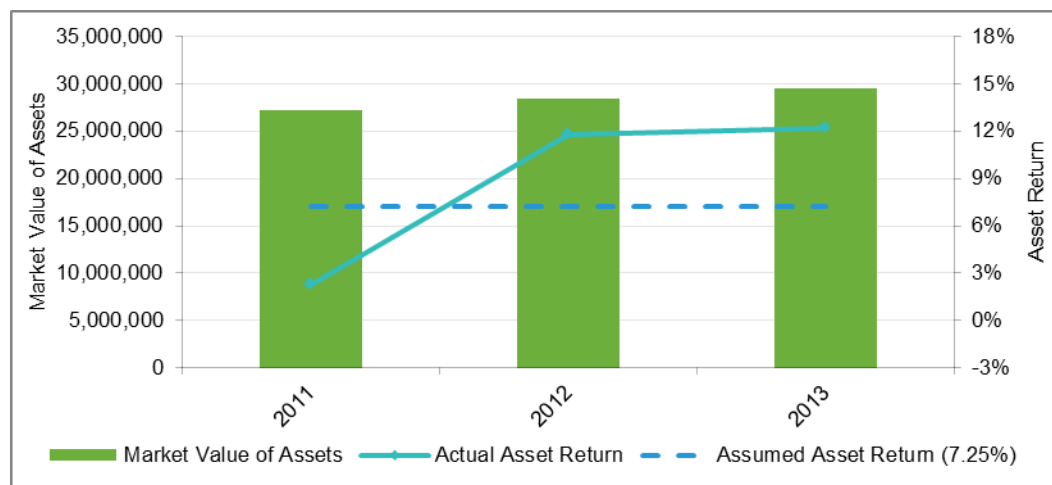
## Section 1: The Valuation Process

### Valuation Input: Asset Data

LRS assets are held in trust and are invested for the exclusive benefit of plan members. The Market Value of Assets is \$29.5 million as of December 31, 2013 and \$28.4 million as of December 31, 2012. The investment return for the market value of assets for calendar year 2013 was 12.21%.

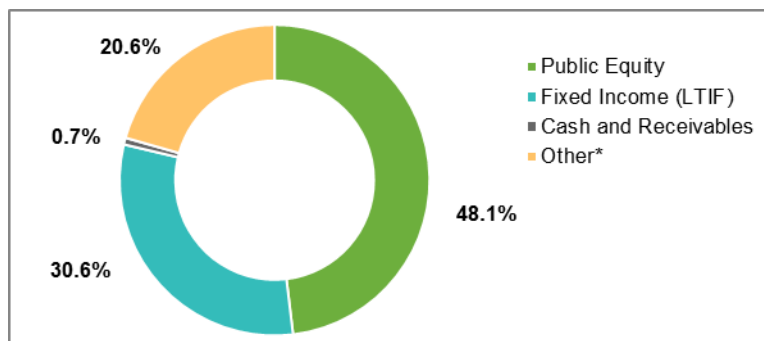
#### Graph 1: Market Value of Asset and Asset Returns

The graph below provides a history of the market value of assets and asset returns over the past three years.



#### Graph 2: Allocation of Investments by Category

The graph below provides the breakdown of the market value of assets at December 31, 2013 by asset category.



\* Real Estate, Alternatives, Inflation and Credit

**Commentary:** Based on historical market returns, the current asset allocation, the current investment policy, and the expectation of future asset returns, as reviewed in the last experience study, the 7.25% discount rate used in this valuation is reasonable and appropriate. The discount rate will be reviewed at the next experience study to be presented to the Board in October 2015.

A detailed summary of the market value of assets is provided in Section 4 of this report.

## Section 1: The Valuation Process

### Valuation Input: Benefit Provisions

Benefit provisions are described in North Carolina General Statutes, Chapter 120.

There were the following changes in benefit provisions from the prior year's valuation:

- 1% cost-of-living adjustment at July 1, 2014
- Return of contributions with interest to all members prior to meeting vesting requirements

Highlights of the benefit provisions are described below.

- An unreduced retirement allowance is payable to members who retire from service after attaining age 65 and five years of creditable service
- The unreduced retirement allowance is equal to 4.02% of a member's highest annual compensation multiplied by the number of years of creditable service
- A reduced retirement allowance is payable to members who retire from service:
  - after attaining age 50 and 20 years of creditable service; or
  - after attaining age 60 and five years of creditable service
- Ancillary benefits are also payable upon the death or disability of a member
- LRS does not provide for explicit cost of living increases as part of the benefit package. Instead, increases may be provided if certain financial conditions are met and/or the legislature passes a budget that provides for a cost-of-living adjustment

**Commentary:** Most Public Sector Retirement Systems in the United States have undergone pension reform where the benefits of members (current retirees and active or future members) have been reduced. Because of the well-funded status of LRS due to the legislature contributing the actuarially required contribution, benefit cuts have not been needed in North Carolina.

A detailed summary of the benefit provisions is provided in Appendix C of this report.

# Section 1: The Valuation Process

## Valuation Input: Actuarial Assumptions

Actuarial assumptions bridge the gap between the information that we know with certainty as of the valuation date (age, gender, service, pay, and benefits of the members) and what may happen in the future. The actuarial assumptions of LRS are reviewed at least every five years. Based on this review, the actuary will make recommendations on the demographic and economic assumptions.

Demographic assumptions describe future events that relate to people such as retirement rates, termination rates, disability rates, and mortality rates. Economic assumptions describe future events that relate to the assets of LRS such as the interest rate, salary increases, the real return, and payroll growth.

The latest assumptions were adopted for use with the December 31, 2009 actuarial valuation, based on the experience study prepared as of December 31, 2009 and adopted by the Board of Trustees on October 21, 2010. The next experience study will be prepared as of December 31, 2014 and presented to the Board in October 2015. Assumptions and methods based on the next experience study, as adopted by the Board, will be used with the December 31, 2015 valuation. This policy of reviewing assumptions every five years is a best practice.

## Valuation Input: Funding Methodology

The Funding Methodology is the payment plan for LRS and is composed of the following three components:

- Actuarial Cost Methods allocate costs to the actuarial accrued liability (i.e. the amount of money that should be in the fund) for past service and normal cost (i.e. the cost of benefits accruing during the year) for current service.
  - The Board of Trustees has adopted Projected Unit Credit as its actuarial cost method
- Asset Valuation Methods smooth or average the market value returns over time to alleviate contribution volatility that results from market returns.
  - 20% of market value plus 80% of the expected actuarial value
- Amortization Methods determine the payment schedule for unfunded actuarial accrued liability (i.e. the difference between the actuarial accrued liability and actuarial value of assets)
  - Payment level: the payment is determined as a level dollar amount, similar to a mortgage payment
  - Payment period: an eight-year open

When compared to other Public Sector Retirement Systems in the United States, the funding policy for LRS is quite aggressive in that the policy pays down the pension debt over a much shorter period of time (8 years) compared to the national average of around 24 years. As such it is a best practice in the industry.

There were no significant changes in actuarial assumptions or funding method from the prior year's valuation. A detailed summary of the actuarial assumptions and methods is provided in Appendix D of this report.

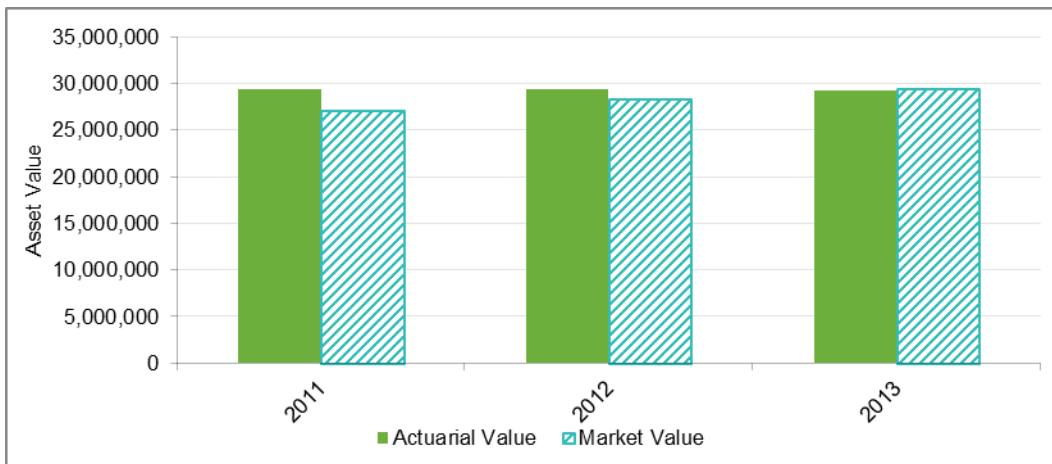
## Section 1: The Valuation Process

### Valuation Results: Actuarial Value of Assets

In order to reduce the volatility that investment gains and losses can have on required contributions and funded status of LRS, the Board adopted an asset valuation method to determine the Actuarial Value of Assets used for funding purposes. The Actuarial Value of Assets is \$29.3 million as of December 31, 2013 and \$29.4 million as of December 31, 2012.

#### Graph 3: Actuarial Value and Market Value of Assets

The graph below provides a history of the market value and actuarial value of assets over the past three years.



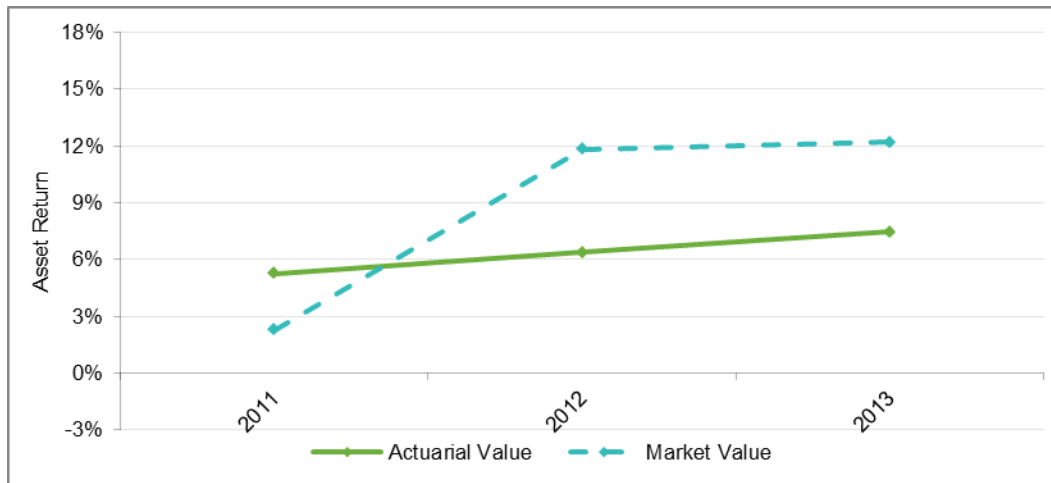
**Commentary:** For the first time in several years, the market value of assets is higher than the actuarial value of assets, which is used to determine employer contributions. This indicates that there are unrecognized asset returns to be recognized in future valuations, which will mitigate the impact of asset returns that are less than the assumed return of 7.25%. As a result, the upward pressure on contributions that we have seen since the Great Recession has been reversed, as seen in the projections of potentially higher funded ratios and lower employer contributions later in this report.

## Section 1: The Valuation Process

### Valuation Results: Actuarial Value of Assets (continued)

#### Graph 4: Asset Returns

The graph below provides a history of the market value and actuarial value of asset returns over the past three years.



**Commentary:** The investment return for the market value of assets for calendar year 2013 was 12.21%. The actuarial value of assets smooths investment gains and losses. The actuarial value of asset return for calendar year 2013 is 7.45% which is higher than the assumed rate of 7.25%. Therefore, LRS experienced an asset gain of \$0.06 million during 2013.

A detailed summary of the Actuarial Value of Assets is provided in Section 4 of this report.

## Section 1: The Valuation Process

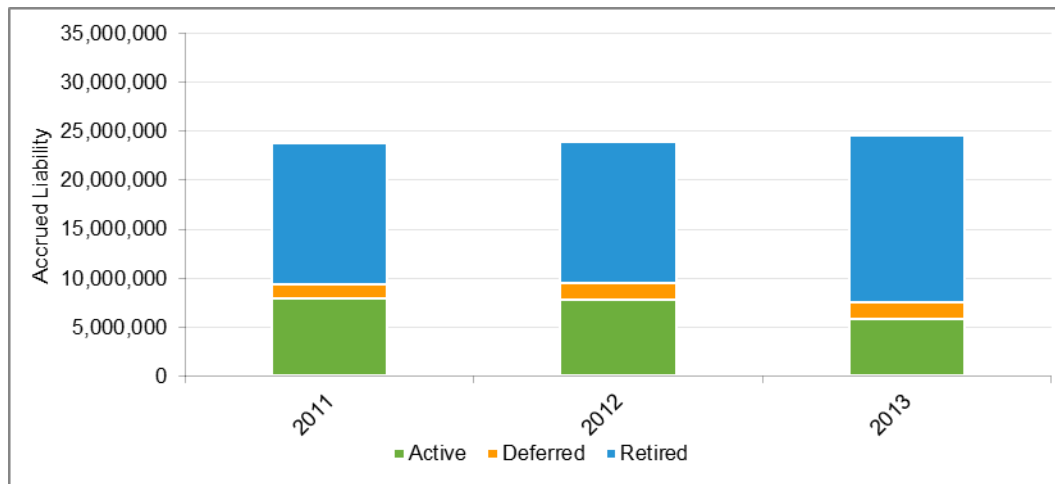
### Valuation Results: Actuarial Accrued Liability

Using the provided membership data, benefit provisions, and actuarial assumptions, the future benefit payments of LRS are estimated. These projected future benefit payments are discounted into today's dollars using the assumed rate of investment return assumption to determine the Present Value of Future Benefits (PVFB) of LRS. The PVFB is an estimate of the current value of the benefits promised to all members as of a valuation date.

Once the PVFB is developed, an actuarial cost method is used to allocate the PVFB. Under the actuarial cost method, the PVFB is allocated to past, current and future service, respectively known as the actuarial accrued liability (AAL), normal cost (NC) and present value of future normal costs (PVFNC). The AAL is also referred to as the amount of money LRS should ideally have in the trust. The NC is also referred to as the cost of benefits accruing during the year.

#### Graph 5: Actuarial Accrued Liability

The graph below provides a history of the actuarial accrued liability over the past three years.



**Commentary:** The AAL increased from \$23.9 million to \$24.6 million during 2013. The Retirement System is an open plan, which means that new members enter the plan each year. In an open plan, liabilities are expected to grow from one year to next as more benefits accrue and the membership approaches retirement. The AAL was \$0.3 million higher than expected prior to legislative changes, which resulted in a demographic loss of \$0.3 million during 2013. Legislation increased the AAL by \$0.1 million.

A detailed summary of the AAL is provided in Section 5 of this report.



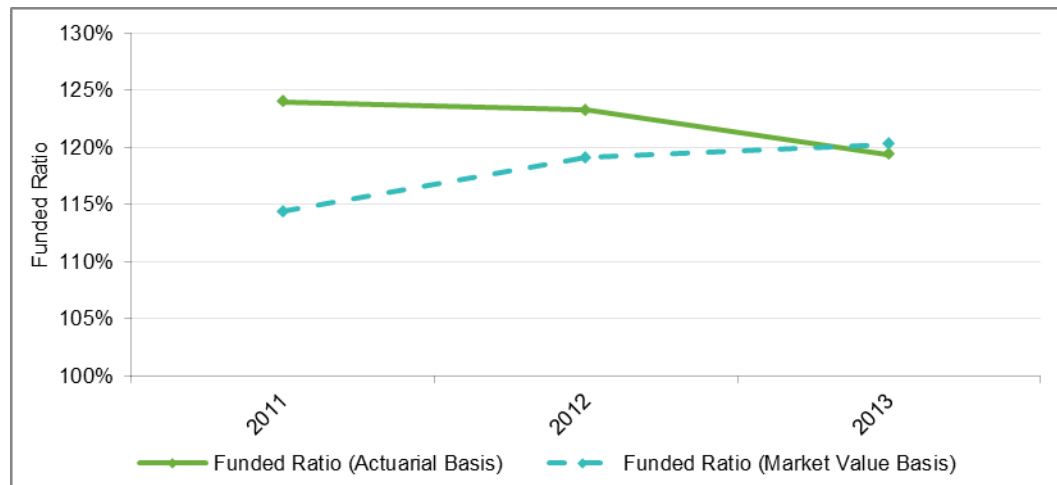
## Section 1: The Valuation Process

### Valuation Results: Funded Ratio

The funded ratio is a measure of the progress that has been made in funding the plan as of the valuation date. It is the ratio of how much money LRS actually has in the fund to the amount LRS should have in the fund.

#### Graph 6: Funded Ratios

The graph below provides a history of the funded ratio on a market and actuarial basis over the past three years.



**Commentary:** The actuarial value of assets basis is used for computing contributions to alleviate contribution volatility. The funded ratio on an actuarial basis decreased from 123.3% at December 31, 2012 to 119.4% at December 31, 2013.

## Section 1: The Valuation Process

### Valuation Results: Employer Contributions

G.S. 120-4.20 provides that the contributions of employers shall consist of a normal contribution and an accrued liability contribution.

The December 31, 2012 valuation suggested that the preliminary total employer contribution rate be set at 0.00% of payroll for the fiscal year ending June 30, 2015. Subsequently, the 2014 Appropriations Act (Session Laws 2014-100) set contributions at 0.00% of payroll effective for the fiscal year ending June 30, 2015. As a result of this December 31, 2013 valuation, the preliminary total employer contribution rate should be set at 1.80% of payroll for the fiscal year ending June 30, 2016, subject to the impact of any future legislative changes effective during that fiscal year. On this basis, these contributions would provide no undistributed gains that could be used for a cost-of-living adjustment or other benefit improvements.

**Commentary:** Even though no contribution has been required in recent years, benefits are accruing at the Normal Cost rate (22.03% as a result of the December 31, 2013 valuation). Accruals in excess of the required employer contribution rate are currently being paid for out of assets in excess of the actuarial accrued liability. As of this valuation, the amount of assets in excess of actuarial accrued liability has reduced to the point where they are not sufficient to reduce the contribution to zero. We expect that the contribution holiday is over for the foreseeable future and the contribution rate will trend towards the 22.03% Normal Cost rate. The potential for rapid increases is quite high and should be expected.

A detailed summary of the employer required contributions rates is provided in Section 6 of this report.

### Valuation Results: Accounting Information

The Governmental Account Standards Board (GASB) issues statements which establish financial reporting standards for defined benefit pension plans and accounting for pension expenditures and expenses for governmental employers.

The valuation has been prepared in accordance with the parameters of Statement Nos. 25, 27, and 67 of the GASB and all applicable Actuarial Standards of Practice. The annual required contribution (ARC) under GASB 25/27 for the fiscal year ending June 30, 2016 is 1.80% of payroll. The Net Pension Liability (Asset) under GASB 67 for the fiscal year ending June 30, 2014, is \$(5,633,000) (compared to \$(4,457,000) for fiscal year ending June 30, 2013). The required financial reporting information for the Retirement System under GASB Nos. 25, 27, and 67 can be found in Section 7 of this report.

## Section 2: Principal Results

This report, prepared as of December 31, 2013, presents the results of the actuarial valuation of the system. The principal results of the valuation and a comparison with the preceding year's results are summarized below.

**Table 1: Summary of Principal Results**

Valuation results as of	12/31/2013	12/31/2012
Active Members		
Number	170	169
Reported Compensation	\$ 3,579,277	\$ 3,510,220
Valuation Compensation*	\$ 3,743,644	\$ 3,740,429
Retired Members and Survivors of Deceased Members Currently Receiving Benefits		
Number	311	283
Annual Allowances	\$ 2,436,106	\$ 2,079,757
Assets		
Actuarial Value (AVA)	\$ 29,318,253	\$ 29,415,872
Market Value	\$ 29,541,619	\$ 28,414,270
Actuarial Accrued Liability (AAL)	\$ 24,557,195	\$ 23,851,789
Unfunded Accrued Liability (AAL-AVA)	\$ (4,761,058)	\$ (5,564,083)
Funded Ratio (AVA/AAL)	119.4%	123.3%
<b>GASB 25/27 Results for Fiscal Year Ending</b>	<b>6/30/2016</b>	<b>6/30/2015</b>
Annual Required Contribution (ARC)** of employer, as a percentage of payroll		
Normal Cost	22.03%	21.59%
Disability Benefit	0.55%	0.65%
Accrued Liability	<u>-20.78%</u>	<u>-22.24%</u>
Total	1.80%	0.00%
Impact of Legislative Changes***	<u>N/A</u>	<u>0.00%</u>
Final Employer ARC	N/A	0.00%

\* Reported compensation adjusted to reflect the assume rate of pay increase prior to the valuation date.

\*\* If the accrued liability contribution was based on the amortization of the unfunded accrued liability over an eight-year period, the total employer ARC for fiscal year ending 6/30/2015 would have been less than \$0, which is not allowed under GASB 25/27. Therefore, the accrued liability contribution was set such that the total ARC equals \$0.

\*\*\* As shown in Table 12, the legislative changes increased the ARC for fiscal year ending 6/30/2015 by 0.64% of payroll. However, this increase does not increase the ARC for fiscal year ending 6/30/2015 above zero.

## Section 3: Membership Data

The Retirement Systems Division provided membership data as of the valuation date for each member of LRS. The membership data assists the actuary in estimating benefits that could be paid in the future. The tables below provide a summary of the membership data used in this valuation. Detailed tabulations of data are provided in Appendix B.

**Table 2: Active Member Data**

	Member Count	Average Age	Average Service	Reported Compensation
Male	133	56.15	5.73	\$ 2,816,451
Female	37	60.99	6.33	762,826
Total	170	57.20	5.86	\$ 3,579,277

**Table 3: Vested Terminated Member Data**

	Member Count	Average Age	Average Service	Deferred Retirement Allowance
Male	31	55.75	10.08	\$ 264,048
Female	9	52.19	9.76	72,945
Total	40	54.95	10.01	\$ 336,993

The table above includes terminated members entitled to retirement benefits but not yet receiving benefits.

## Section 3: Membership Data

**Table 4: Non-Vested Terminated Member Data**

	Member Count	Average Age	Average Service	Accumulated Contributions
Male	46	59.13	2.81	\$ 256,683
Female	8	59.32	1.73	26,100
Total	54	59.16	2.65	\$ 282,783

The table above includes non-vested terminated members who have not received a refund of contributions.

**Table 5: Data for Members Currently Receiving Benefits**

	Member Count	Average Age	Annual Retirement Allowances
<u>Retired Members (Healthy at Retirement)</u>			
Male	195	76.39	\$ 1,623,964
Female	49	75.26	403,393
Total	244	76.16	\$ 2,027,357
<u>Survivors of Deceased Members</u>			
Male	2	63.79	\$ 20,118
Female	65	76.88	388,631
Total	67	76.49	\$ 408,749
Grand Total	311	76.23	\$ 2,436,106

## Section 4: Asset Data

Assets are held in trust and are invested for the exclusive benefit of LRS members. The tables below provide the details of the Market Value of Assets for the current and prior year's valuations.

**Table 6: Market Value of Assets**

Asset Data as of	12/31/2013	12/31/2012
Beginning of Year Market Value of Assets	\$ 28,414,270	\$ 27,183,483
Contributions	236,553	252,250
Benefit Payments	(2,442,691)	(2,122,629)
Investment Income	<u>3,333,487</u>	<u>3,101,166</u>
Net Increase/(Decrease)	1,127,349	1,230,787
End of Year Market Value of Assets	\$ 29,541,619	\$ 28,414,270
Estimated Net Investment Return on Market Value	12.21%	11.81%

**Table 7: Allocation of Investments by Category of the Market Value of Assets**

Asset Data as of	12/31/2013	12/31/2012
Allocation by Dollar Amount		
Public Equity	\$ 14,218,331	\$ 12,651,778
Fixed Income (LTIF)	9,049,359	10,044,909
Cash and Receivables	211,532	70,199
Other*	<u>6,062,397</u>	<u>5,647,384</u>
Total Market Value of Assets	\$ 29,541,619	\$ 28,414,270
Allocation by Percentage of Asset Value		
Public Equity	48.13%	44.53%
Fixed Income (LTIF)	30.63%	35.35%
Cash and Receivables	0.72%	0.25%
Other*	<u>20.52%</u>	<u>19.87%</u>
Total Market Value of Assets	100.00%	100.00%

\* Real Estate, Alternatives, Inflation and Credit

## Section 4: Asset Data

In order to reduce the volatility that investment gains and losses can have on the required contributions and funded status of LRS, the Board adopted an asset valuation method to determine the Actuarial Value of Assets used for funding purposes. The table below provides the calculation of the Actuarial Value of Assets at the valuation date.

**Table 8: Actuarial Value of Assets**

Asset Data as of	12/31/2013
(a) Beginning of Year Actuarial Value of Assets	\$ 29,415,872
(b) Contributions	236,553
(c) Benefit Payments	<u>(2,442,691)</u>
(d) Net Cash Flow: (b) + (c)	(2,206,138)
(e) Expected Investment Return: [(a) x 7.25%] + [(d) x 3.625%]	2,052,678
(f) Expected End of Year Actuarial Value of Assets: (a) + (d) + (e)	29,262,412
(g) End of Year Market Value of Assets	29,541,619
(h) Excess of Market Value over Expected Actuarial Value of Assets: (g) - (f)	279,207
(i) 20% Adjustment toward Market Value: (h) x 20%	55,841
(j) End of Year Actuarial Value of Assets: (f) + (i)	29,318,253
(k) Estimated Net Investment Return on Actuarial Value	7.45%

**Commentary:** The actuarial value of assets smooths investment gains/losses, resulting in less volatility in the employer contribution.

## Section 5: Liability Results

Using the provided membership data, benefit provisions, and actuarial assumptions, the future benefit payments of LRS are estimated. These projected future benefit payments are discounted into today's dollars using the assumed rate of investment return assumption to determine the Present Value of Future Benefits. The Present Value of Future Benefits is allocated to past, current and future service, respectively known as the actuarial accrued liability, normal cost and present value of future normal costs. The table below provides these liability numbers for the current and prior year's valuations.

**Table 9: Liability Summary**

Valuation Results as of	12/31/2013	12/31/2012
(a) Present Value of Future Benefits		
(1) Active Members	\$ 13,519,032	\$ 14,124,119
(2) Terminated Members	1,695,813	1,652,463
(3) Members Currently Receiving Benefits	16,981,822	14,408,568
(4) Total	\$ 32,196,667	\$ 30,185,150
(b) Present Value of Future Normal Costs	\$ 7,639,472	\$ 6,333,361
(c) Actuarial Accrued Liability: (a4) - (b)	\$ 24,557,195	\$ 23,851,789
(d) Actuarial Value of Assets	\$ 29,318,253	\$ 29,415,872
(e) Unfunded Accrued Liability: (c) - (d)	\$ (4,761,058)	\$ (5,564,083)



## Section 5: Liability Results

The table below provides a reconciliation of the prior year's unfunded actuarial accrued liability to the current year's actuarial accrued liability.

**Table 10: Reconciliation of Unfunded Actuarial Accrued Liability**

(in millions)		
Unfunded Actuarial Accrued Liability (UAAL) as of 12/31/2012	\$	(5.6)
Normal Cost during 2013		1.1
Reduction due to Actual Contributions during 2013		(0.2)
Interest on UAAL, Normal Cost, and Contributions		(0.4)
Asset (Gain)/Loss		(0.1)
Actuarial Accrued Liability (Gain)/Loss		0.3
Impact of Legislative Changes		<u>0.1</u>
Unfunded Actuarial Accrued Liability (UAAL) as of 12/31/2013	\$	(4.8)

**Commentary:** The negative unfunded actuarial accrued liability, or “excess” pension assets, shrank faster than expected during the past year primarily due to the reasons outlined at the beginning of this report.

## Section 6: Annual Required Contribution

The annual required contribution consists of a normal cost rate and an accrued liability rate. The normal cost rate is the employer's portion of the cost of benefits accruing during the year after reducing for the member contribution. The accrued liability rate is the payment toward the unfunded accrued liability in order to pay off the unfunded accrued liability over 8 years. The Disability benefit rate is the Normal Cost rate necessary to provide the disability benefit on a one-year term basis.

The table below provides the calculation of the annual required contribution for the current and prior years' valuations.

**Table 11: Calculation of the Annual Required Contribution (ARC)**

Valuation Date ARC for Fiscal Year Ending	12/31/2013 6/30/2016	12/31/2012 6/30/2015
<b>Normal Cost Rate Calculation</b>		
(a) Normal Cost	\$ 1,086,850	\$ 1,069,406
(b) Valuation Compensation	\$ 3,743,644	\$ 3,740,429
(c) Total Normal Cost Rate: (a) / (b)	29.03%	28.59%
(d) Employee Contribution Rate	<u>7.00%</u>	<u>7.00%</u>
(e) Employer Normal Cost Rate: (c) - (d)	22.03%	21.59%
<b>Disability Benefit Rate Calculation</b>		
(f) Disability Benefit Normal Cost	\$ 20,728	\$ 24,465
(g) Valuation Compensation	\$ 3,743,644	\$ 3,740,429
(h) Total Normal Cost Rate: (f) / (g)	0.55%	0.65%
<b>Accrued Liability Rate Calculation</b>		
(i) Unfunded Accrued Liability	\$ (4,761,058)	\$ (5,564,083)
(j) Amortization of Unfunded Accrued Liability	\$ (777,855)	\$ (909,051)
(k) Valuation Compensation	\$ 3,743,644	\$ 3,740,429
(l) Accrued Liability Rate: (j) / (k)	(20.78%)	(24.30%)
Total ARC (e) + (h) + (l)	1.80%	(2.06%)
Final ARC*	1.80%	0.00%

\* If the accrued liability contribution was based on the amortization of the unfunded accrued liability over an eight-year period, the total employer ARC for fiscal year ending 6/30/2015 would have been less than \$0, which is not allowed under GASB 25/27. Therefore, the accrued liability contribution was set such that the total ARC equals \$0.

## Section 6: Annual Required Contribution

The table below provides a reconciliation of the annual required contribution for the current and prior years' valuations.

**Table 12: Reconciliation of the Change in the ARC**

Fiscal year ending June 30, 2015 Preliminary ARC (based on December 31, 2012 valuation)	(2.06%)
Impact of Legislative Changes	<u>0.64%</u>
Fiscal year ending June 30, 2015 Final ARC	(1.42%)
Change Due to Demographic (Gain)/Loss	3.35%
Change Due to Investment (Gain)/Loss	(0.25%)
Change Due to Member Contributions Less than Expected	<u>0.12%</u>
Fiscal year ending June 30, 2016 Preliminary ARC (based on December 31, 2013 valuation)	1.80%

**Table 13: Cost of Benefit Enhancements**

Calculation as of	12/31/2013	12/31/2012
Increase in ARC for a 1% COLA*	0.80%	0.64%

- \* The 1% COLA calculated at the December 31, 2013 valuation would be effective July 1, 2015. The COLA would be paid in full to retired members and survivors of deceased members on the retirement roll on July 1, 2014 and would be prorated for retired members and survivors of deceased members who commence benefits after July 1, 2014 but before June 30, 2015.

## Section 7: Accounting Results

The section contains the accounting information for Governmental Accounting Standards Board (GASB) Statement No. 25, 27 and 67 for fiscal year ending June 30, 2014 based on a valuation date of December 31, 2013.

Please note that GASB Statement No. 25 (*Financial Reporting for Defined Benefit Pension Plans*) is applicable for fiscal years ending prior to 2014 and has been replaced by GASB Statement No. 67 (*Financial Reporting for Pension Plans*) for fiscal years ending 2014 and later. Similarly, GASB Statement No. 27 (*Accounting for Pensions by State and Local Governmental Employers*) is applicable for fiscal years ending prior to 2015 and has been replaced by GASB Statement No. 68 (*Accounting and Financial Reporting for Pensions*) for fiscal years ending 2015 and later.

GASB Statement Nos. 25 and 27 set forth certain items of information to be disclosed in the financial statements of the Plan. The tables below provide a distribution of the number of employees by type of membership, and the schedule of funding progress.

**Table 14: Number of Active and Retired Members  
as of December 31, 2013**

Group	Number
Retired members and survivors of deceased members currently receiving benefits	311
Terminated members and survivors of deceased members entitled to benefits but not yet receiving benefits	94
Active members	<u>170</u>
Total	575

**Table 15: Schedule of Funding Progress**

Actuarial Valuation Date	(a) Actuarial Value of Assets	(b) Entry Age Actuarial Accrued Liability	(b) - (a) Unfunded Actuarial Accrued Liability (UAAL)	(a)/(b) Funded Ratio	(c) Covered Payroll	[(b) - (a)] / (c) UAAL as a Percentage of Covered Payroll
12/31/2007	\$ 30,698,398	\$ 22,883,168	\$ (7,815,230)	134.2%	\$ 3,679,568	-212.40%
12/31/2008	30,097,153	23,091,832	(7,005,321)	130.3%	3,669,989	-190.88%
12/31/2009	29,792,114	23,510,848	(6,281,266)	126.7%	3,622,377	-173.40%
12/31/2010	29,834,730	23,751,803	(6,082,927)	125.6%	3,668,183	-165.83%
12/31/2011	29,468,021	23,756,551	(5,711,470)	124.0%	3,678,834	-155.25%
12/31/2012	29,415,872	23,851,789	(5,564,083)	123.3%	3,510,220	-158.51%
12/31/2013	29,318,253	24,557,195	(4,761,058)	119.4%	3,579,277	-133.02%

## Section 7: Accounting Results

The tables below provide the calculation of the annual pension cost and net pension obligation and a three-year trend of the net pension obligation.

**Table 16: Annual Pension Cost and Net Pension Obligation**

Fiscal Year Ending	June 30, 2014
(a) Employer annual required contribution	\$ 0
(b) Interest on net pension obligation	(8,000)
(c) Adjustment to annual required contribution	<u>18,000</u>
(d) Annual pension cost: (a) + (b) + (c)	\$ 10,000
(e) Employer contributions made for fiscal year ending 6/30/2014	<u>0</u>
(f) Increase/(decrease) in net pension obligation: (d) - (e)	\$ 10,000
(g) Net pension obligation beginning of fiscal year	<u>(113,000)</u>
(h) Net pension obligation end of fiscal year: (f) + (g)	\$ (103,000)

**Table 17: Trend Information for the Net Pension Obligation**

Fiscal Year Ending	Annual Pension Cost (APC)	Percentage of APC Contributed	Net Pension Obligation
6/30/2012	\$ 13,000	0.0%	\$ (123,000)
6/30/2013	10,000	0.0%	(113,000)
6/30/2014	10,000	0.0%	(103,000)

## Section 7: Accounting Results

The tables below provide the annual required contribution (ARC) of the employer as a percentage of payroll (determined in accordance with the parameters of GASB 25/27) and additional information as of the valuation date.

**Table 18: Annual Required Contribution Based on the Valuation as of December 31, 2013**

Fiscal Year Ending	June 30, 2016
Normal Cost	22.03%
Disability Benefit Cost	0.55%
Accrued Liability	<u>(20.78%)</u>
Total	1.80%

**Table 19: Additional Information for GASB Statement Nos. 25 and 27**

Valuation Date	12/31/2013
Actuarial Cost Method	Projected Unit Credit
Amortization Method	Level dollar open
Amortization Period	8 years
Asset Valuation Method	20% of market value plus 80% of expected actuarial value
Actuarial Assumptions	
Investment Rate of Return	7.25%
Projected Salary Increases	7.50%
Cost-of-living Adjustments	N/A

## Section 7: Accounting Results

GASB Statement No. 67 set forth certain items of information to be disclosed in the financial statements of the Plan. The tables below provide the schedule of changes in Net Pension Liability (Asset).

**Table 20: Schedule of Changes in Net Pension Liability (Asset)**

Calculation as of	June 30, 2014
<b>Total Pension Liability</b>	
Service Cost	\$ 747,000
Interest	1,678,000
Changes of Benefit Terms	146,000
Difference between Expected and Actual Experience	762,000
Change of Assumptions	0
Benefit Payments, including Refund of Member Contributions	(2,614,000)
Net Change in Total Pension Liability	\$ 719,000
Total Pension Liability - Beginning of Year	\$ 23,699,000
Total Pension Liability - End of Year	\$ 24,418,000
<b>Plan Fiduciary Net Position</b>	
Employer Contributions	\$ 0
Member Contributions	253,000
Net Investment Income	4,293,000
Benefit Payments, including Refund of Member Contributions	(2,614,000)
Administrative Expenses	(37,000)
Other	0
Net Change in Fiduciary Net Position	\$ 1,895,000
Plan Fiduciary Net Position - Beginning of Year	\$ 28,156,000
Plan Fiduciary Net Position - End of Year	\$ 30,051,000

**Table 21: Net Pension Liability (Asset)**

Calculation as of	June 30, 2014	June 30, 2013
Total Pension Liability	\$ 24,418,000	\$ 23,699,000
Plan Fiduciary Net Position	30,051,000	28,156,000
Net Pension Liability (Asset)	\$ (5,633,000)	\$ (4,457,000)
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	123.07%	118.81%

## Section 7: Accounting Results

The table below is the sensitivity of the net pension liability to changes in the discount rate.

**Table 22: Sensitivity of the Net Pension Liability at June 30, 2014 to Changes in the Discount Rate**

	1% Decrease	Current	1% Increase
Discount Rate	6.25%	7.25%	8.25%
Net Pension Liability (Asset)	(3,859,000)	(5,633,000)	(7,190,000)

The discount rate used to measure the total pension liability was 7.25%. The projection of cash flows used to determine the discount rate assumed that System contributions will continue to follow the current funding policy. Based on those assumptions, the System's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Please see Appendix E for additional detail.



## Appendix A: Valuation Process and Glossary of Actuarial Terms

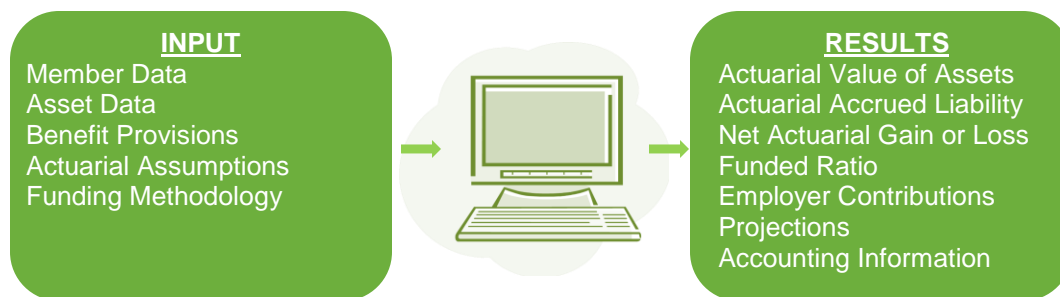
### Purpose of an Actuarial Valuation

The majority of Public Sector Retirement Systems in the State of North Carolina are defined benefit (DB) retirement systems. Under a DB Retirement System, the amount of benefits payable to a member upon retirement, termination, death or disability is defined in various contracts and legal instruments and is based, in part, on the member's years of credited service and final compensation. The amount of contribution needed to fund these benefits cannot be known with certainty. A primary responsibility of the Board of Trustees of a Retirement System is to establish and monitor a funding policy for the contributions made to the Retirement System.

While somewhat uncommon, in some jurisdictions, contributions are made by the plan sponsor as benefits come due. This is known as pay-as-you-go financing. More commonly, contributions for benefits are made in advance during the course of active employment of the members. This is known as actuarial pre-funding. For example, the State of North Carolina mandates for the Teachers' and State Employees' Retirement System (the "State Plan") that "on account of each member there shall be paid into the pension accumulation fund by employers an amount equal to a certain percentage of the actual compensation of each member to be known as the 'normal contribution'..." and further "the normal rate of contribution shall be determined by the actuary after each valuation."

### The Actuarial Valuation Process

The following diagram summarizes the inputs and results of the actuarial valuation process. A narrative of the process follows the diagram. The reader may find it worthwhile to refer to the diagram from time to time.



Under the actuarial valuation process, current information about Retirement System members is collected annually by staff at the direction of the actuary, namely member data, asset data and information on benefit provisions. Member data is collected for each member of the Retirement System. The member data will assist the actuary in estimating benefits that could be paid in the future. The member information the actuary collects to estimate the amount of benefit includes elements such as current service, salary and benefit group identifier for members that have not separated service; for those that have, the actual benefit amounts are collected. The actuary collects information such as gender and date of birth to determine when a benefit might be paid and for how long. The actuary collects summary information about assets as of the valuation date and information on cash flows for the year ending on the valuation date. Information about

## Appendix A: Valuation Process and Glossary of Actuarial Terms

benefit provisions as of the valuation date is also collected. To bridge the gap between the information collected and potential benefits to be paid in the future, the actuary must make assumptions about future activities. These assumptions are recommended by the actuary to the Boards based on the results of an experience review. An experience review is a review of the Retirement System over a period of time, typically five years, where the actuary analyzes the demographic and economic assumptions of the Retirement System. Based on this review, the actuary will make recommendations on the demographic assumptions, such as when members will be projected to retire, terminate, become disabled and/or die in the future, as well as the economic assumptions, such as what rate of return is projected to be earned by the fund based on the Retirement System investment policy and what level of future salary increases is expected for members. To maintain the assumptions, the Board should adopt a prudent policy of having an experience review being performed every five years. The next experience review for the North Carolina Retirement Systems will be based on the five-year period ending on December 31, 2014 and will be presented during 2015. Using these assumptions, the actuary is able to use the member data, asset data and benefit provision information collected to project the benefits that will be paid from the Retirement System to current members. These projected future benefit payments are based not only on service and pay through the valuation date but includes future pay and service, which has not yet been earned by the members but is expected to be earned.

These projected future benefit payments are discounted into today's dollars using the assumed rate of investment return assumption to determine the Present Value of Future Benefits (PVFB) of the Retirement System. The PVFB is an estimate of the value of the benefits promised to all members as of a valuation date. If the Retirement System held assets equal to the PVFB and all the assumptions were realized, there would be sufficient funds to pay off all the benefits to be paid in the future for members in the Retirement System as of the valuation date.

The PVFB is a large sum of money, typically much larger than the amount of Retirement System assets held in the trust. The next step is for the actuary to apply the Funding Policy as adopted by the Board to determine the employer contributions to be made to the Retirement System so that the gap between the PVFB and assets is systematically paid off over time. The Funding Policy is adopted by the Board based on discussions with the actuary. When the Board develops a funding policy, a balance between contributions which are responsive to the needs of the Retirement System yet stable should be struck. There are many different funding policies for the Board to consider, and the actuary is responsible for discussing the various features of the funding policies under consideration. Funding Policies are generally reviewed during an experience review, but it is not uncommon to review a funding policy in between, particularly during period where large increases or decreases in contributions are expected. The Funding Policy is composed of three components: the actuarial cost method, the asset valuation method, and the amortization method.

Once the PVFB is developed, an actuarial cost method is used to allocate the PVFB. Under the actuarial cost method, the PVFB is allocated to past, current and future service, respectively known as the actuarial accrued liability (AAL), normal cost (NC) and present value of future normal costs (PVFNC). The actuary computes the liability components (PVFB, NC, AAL, and PVFNC) for each participant in the Retirement

## Appendix A: Valuation Process and Glossary of Actuarial Terms

System at the valuation date. These liability components are then totaled for the Retirement System. There are many actuarial cost methods. Different actuarial methods will produce different contribution patterns, but do not change the ultimate cost of the benefits. The entry age normal cost method is the most prevalent method used for public sector plans in the United States, because the expected normal cost is calculated in such a way that it will tend to stay level as a percent of pay over a member's career. Most of the North Carolina Retirement Systems use the entry age normal cost method; LGERS uses a method known as frozen initial liability, which is similar to entry age normal but allows for the individualized payments for local employers when they enter LGERS.

The actuarial accrued liability (AAL) is also referred to as the amount of money the Retirement System should ideally have in the trust. The unfunded actuarial accrued liability (UAAL) is the portion of actuarial accrued liability that is not covered by the assets of the Retirement System. The UAAL can be a negative number, which means that the Retirement System has more assets than actuarial accrued liability. We refer to this condition as overfunded liability in this summary. Having UAAL does not indicate that the Retirement System is in failing actuarial health. UAAL is a common occurrence. Currently, many Retirement Systems in the United States have UAAL as a result of the Great Recession of 2008. Another related statistic of the Retirement System is the funded ratio. The funded ratio is the percent of the actuarial accrued liabilities covered by the actuarial value of assets. The assets used for these purposes are an actuarial value of assets (AVA), not market. The actuarial value of assets is based on the asset valuation method as recommended by the actuary and adopted by the Board. An actuarial value of assets is a smoothed, or averaged, value of assets, which is used to limit employer contribution volatility. Typically, assets are smoothed, or averaged, over a period of 3 to 5 years, although longer periods are becoming more common. By averaging returns, the UAAL is not as volatile, which we will see later results in contributions that are not as volatile as well. The North Carolina Retirement Systems use an actuarial value of assets with a smoothing period of 5 years.

While having UAAL is common, it is acceptable only if it is systematically being paid off. The method by which the UAAL is paid off is known as the amortization method. The concept is similar to that of a mortgage payment. The Board adopts the amortization method used to pay off the UAAL over a period of time. The amortization method is composed of the amortization period, the amount of payment increase, whether the period is open or closed and by the amount of amortization schedules. The amortization period is the amount of time over which the UAAL will be paid off. This is generally a period of thirty years or less, but actuaries are beginning to recommend shorter periods. The payments can be developed to stay constant from year to year like a mortgage, but often they are developed to increase each year at the same level payroll increases. Amortization type can be closed or open. Under a closed period, the UAAL is expected to be paid off over the amortization period. This is similar to a typical mortgage. Under an open period, the amortization period remains unchanged year after year. The concept is similar to re-mortgaging annually. In many instances, an amortization schedule is developed, whereby the UAAL is amortized over a closed period from the point the UAAL is incurred. Finally, some amortization methods are defined by a schedule of payments, where a new schedule of payments is added with each valuation. Regardless of the amortization type or period, the funding policy should generate a contribution that pays off the UAAL, which results in the funded ratio trending to 100% over time. Caution

## Appendix A: Valuation Process and Glossary of Actuarial Terms

should be used when an open method is used, because typically an open amortization policy does not result in the UAAL being paid off. North Carolina pays off a much larger amount of UAAL compared to other states. While many states struggle to pay a 30-year level percent of pay UAAL contribution, which doesn't even reduce the amount of UAAL, North Carolina pays down the UAAL with level dollar payments over 12 years. This aggressive payment of UAAL results in North Carolina being home to many of the best funded Public Retirement Systems in the United States.

To satisfy the requirements of the State of North Carolina, the actuary calculates the total annual contribution to the Retirement System as the normal cost plus a contribution towards UAAL. Said another way, this contribution is sufficient to pay for the cost of benefits accruing during the year (normal cost) plus the mortgage payment (UAAL payment). The total contribution is reduced by the amount of member contributions, if any, to arrive at the employer contribution. For the aggressive North Carolina contribution policy to be effective, the amounts that Buck calculates need to be contributed. With very limited exception, North Carolina has contributed the amounts that Buck has calculated, which has resulted in the North Carolina Retirement Systems being among the best funded in the United States.

An actuarial valuation report is produced annually, which contains the contribution for the fiscal year as well as the funded ratio of the Retirement System. The primary purpose of performing an actuarial valuation annually is to replace the estimated activities from the previous valuation, which were based on assumptions, with the actual experience of the Retirement System for the prior year. The experience gain (loss) is the difference between the expected and the actual UAAL of the Retirement System. An experience loss can be thought of as the amount of additional UAAL over and above the amount that was expected from the prior year due to deviation of actual experience from the assumption. Similarly, an experience gain can be thought of as having less UAAL than that which was expected from the prior year assumptions. As an example, if the Retirement System achieves an asset return of 15% when the assumption was a 7.25% return, an actuarial gain is said to have happened, which typically results in lower contributions and higher funded ratio, all else being equal. Alternatively, a return of 2% under the same circumstances would result in an actuarial loss, requiring an increase in contributions and a funded ratio that is lower than anticipated. Experience gains and losses are common within the valuation process. Typically gains and losses offset each other over time. To the extent that does not occur, the reasons for the gains and losses should be understood, and appropriate recommendations should be made by the actuary after an experience review to adjust the assumptions.

The actuarial valuation report will contain histories of key statistics from prior actuarial valuation reports. In particular, a history of the funded ratio of the Retirement System is an important exhibit. Trustees should understand the reason for the trend of the funded ratio of the Retirement System over time. The actuary will discuss the reasons for changes in the funded ratio of the Retirement System with each valuation report. To the extent that there are unexplained changes in funded ratio corrective action should be explored and the actuary will make recommendations as to whether there should be changes in the assumptions, funding policy, or some other portion of the actuarial valuation process.

## Appendix A: Valuation Process and Glossary of Actuarial Terms

In addition to historical information, projections of contributions and funded ratio based on current assumptions can sometimes be found in an actuarial valuation report. Projections of contributions can allow the employer to plan their budget accordingly. Surprises in Retirement System contributions to be paid by the employer serve no one. A one-year projection based on “bad” asset returns can provide ample time for the employer to plan, or allow for a discussion of changing the funding policy to occur. Contribution surprises are a primary contributor to employers considering pension reform. It is important to keep the employer apprised of future contribution requirements. A projection of funded ratio can serve the Trustees by illustrating the trend of the funded ratio over time. The funded ratio, under a prudent funding policy, should trend to 100% over a period of less than 30 years. (It is worthwhile to note that while 30 years has served as an industry standard for the longest period over which 100% funding should be achieved, that period is coming under scrutiny by the actuarial community and will likely be shortened.) If a projection of funded ratio does not trend to 100% over time, consideration should be given to fixing the funding policy to achieve this goal. For the North Carolina Retirement Systems, projections are generally performed for the January Board meetings. While the projection period has tended to be limited to five years, a longer projection would show the funded ratio trend to 100% much faster than other Public Retirement Systems.

The actuarial report will contain schedules of information about the census, plan and asset information submitted by Retirement System staff upon which the actuarial valuation is based. It is important that the Board of Trustees review that information and determine if the information is consistent with their understanding of the Retirement System. If after questioning staff, the Board of Trustees is not comfortable that the information provided is correct, the actuary should be notified to determine if the actuarial valuation report should be corrected.

Finally, the valuation report and/or presentation should contain sufficient information in an understandable fashion to allow the Board to take action and adopt the contribution rate for the upcoming year. It should also allow stakeholders to understand key observations over the past year that resulted in contributions increasing (or decreasing) and where contributions are headed. The actuary is always open to making the results understandable. Buck works with the North Carolina Retirement Division to make your reports and presentations understandable and actionable. If something doesn't make sense – speak up!!

# Appendix A: Valuation Process and Glossary of Actuarial Terms

## Glossary

Note that the first definitions given are the “official” definitions of the term. For some terms there is a second definition, in italics, which is the unofficial definition.

**Actuarial Accrued Liability (AAL).** The portion of the Present Value of Projected Benefits (PVFB) allocated to past service. Also difference between (i) the actuarial present value of future benefits, and (ii) the present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.” *The amount of money that should be in the Fund. The funding target.*

**Actuarial Assumptions.** Estimates of future plan experience with respect to rates of mortality, disability, retirement, investment income and salary increases. Demographic (“people”) assumptions (rates of mortality, separation, and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic (“money”) assumptions (salary increases and investment income) consist of an underlying rate appropriate in an inflation-free environment plus a provision for a long-term average rate of inflation. *Estimates of future events used to project what we know now- current member data, assets, and benefit provisions – into an estimate of future benefits.*

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the Present Value of Projected Benefits (PVFB) between the normal costs to be paid in the future and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**Actuarial Methods.** The collective term for the Actuarial Cost Method, the Amortization Payment for UAAL Method, and the Asset Valuation Method used to develop the contribution requirements for the Retirement System. *The Funding Policy.*

**Actuarial Equivalent.** Benefits whose actuarial present values are equal.

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

**Actuarial Value of Assets (AVA).** A smoothed value of assets which is used to limit contribution volatility. Also known as the funding value of assets. *Smoothed value of assets.*



## Appendix A: Valuation Process and Glossary of Actuarial Terms

**Amortization Payment for UAAL.** Payment of the unfunded actuarial accrued liability by means of periodic contributions of interest and principal, as opposed to a lump sum payment. The components of the amortization payment for UAAL includes:

- Amortization Period Length – Generally amortization periods up to 30 years are allowed. Similar to a mortgage, the shorter the amortization period, the higher the payment and the faster the UAAL is paid off.
- Amortization payment increases – Future payments can be level dollar, like a mortgage, or as a level percent of pay. Most Retirement Systems amortize UAAL as a level percent of pay which when combined with the employer normal cost that is developed as a level percent of pay can result in contributions that are easier to budget.
- Amortization type Amortization schedule can be closed or open. A closed amortization schedule is similar to a mortgage – at the end of the amortization period the UAAL is designed to be paid off. An open amortization period is similar to refinancing the UAAL year after year.
- Amortization schedule UAAL can be amortized over a single amortization period, or it can be amortized over a schedule.

*The amortization payment for UAAL can be thought of as the UAAL mortgage payment.*

**Asset Valuation Method.** The components of how the actuarial value of assets is to be developed.

**Experience Gain Loss.** A measure of the difference between actual experience and experience anticipated by a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used. *The experience Gain (Loss) represents how much the actuary missed the mark in a given year.*

**Funded Ratio.** The percent of the actuarial accrued liabilities covered by the actuarial value of assets. Also known as the funded status. *The ratio of how much money you actually have in the fund to the amount you should have in the fund.*

**Normal Cost.** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” An amortization payment toward the unfunded actuarial accrued liability is paid in addition to the normal cost to arrive at the total contribution in a given year. *The cost of benefits accruing during the year.*

**Present Value of Future Normal Cost (PVFNC).** The portion of the Present Value of Projected Benefits (PVFB) allocated to future service. *The value in today’s dollars of the amount of contribution to be made in the future for benefits accruing for members in the Retirement System as of the valuation date. Note that in practice, this number is rarely discussed.*

## Appendix A: Valuation Process and Glossary of Actuarial Terms

**Present Value of Future Benefits (PVFB).** The projected future benefit payments of the plan are discounted into today's dollars using an assumed rate of investment return assumption to determine the Present Value of Future Benefits (PVFB) of the Retirement System. The PVFB is the discounted value of the projected benefits promised to all members as of a valuation date, including future pay and service for members which has not yet been earned. *If the Retirement System held assets equal to the PVFB and all the assumptions were realized, there would be sufficient funds to pay off all the benefits to be paid in the future for members in the Retirement System as of the valuation date.*

**Reserve Account.** An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

**Unfunded Actuarial Accrued Liability (UAAL).** The difference between the actuarial accrued liability (AAL) and actuarial value of assets (AVA). The UAAL is sometimes referred to as "unfunded accrued liability." *Funding shortfall, or prefunded amount if negative.*

**Valuation Date.** The date that the actuarial valuation calculations are performed as of. *Also known as the "snapshot date".*



## Appendix B: Detailed Tabulations of Member Data

**Table B-1: The Number and Average Reported Compensation of Active Members Distributed by Age and Service as of December 31, 2013**

Age	Years of Service										Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	
Under 25	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	1	0	0	0	0	0	0	0	1
	0	0	20,659	0	0	0	0	0	0	0	20,659
30 to 34	2	7	0	0	0	0	0	0	0	0	9
	14,328	20,659	0	0	0	0	0	0	0	0	19,252
35 to 39	1	4	2	1	0	0	0	0	0	0	8
	3,554	20,659	20,659	20,659	0	0	0	0	0	0	18,521
40 to 44	0	10	1	2	0	0	0	0	0	0	13
	0	20,659	20,659	20,659	0	0	0	0	0	0	20,659
45 to 49	0	9	3	0	1	0	0	0	0	0	13
	0	20,659	17,790	0	20,659	0	0	0	0	0	19,997
50 to 54	0	9	6	0	0	0	0	0	0	0	15
	0	20,659	26,400	0	0	0	0	0	0	0	22,955
55 to 59	0	21	6	3	1	0	0	0	0	0	31
	0	20,606	21,956	20,659	24,946	0	0	0	0	0	21,012
60 to 64	0	23	6	2	1	0	0	1	0	0	33
	0	20,640	20,659	43,367	20,659	0	0	20,659	0	0	22,022
65 to 69	0	9	4	6	2	2	1	1	0	0	25
	0	20,659	20,659	20,659	20,659	20,659	20,659	25,040	0	0	20,834
70 & Up	0	6	7	4	3	0	1	1	0	0	22
	0	22,471	20,659	20,659	20,659	0	20,659	20,659	0	0	21,153
Total	3	98	36	18	8	2	2	3	0	0	170
	10,737	20,754	21,593	23,182	21,195	20,659	20,659	22,119	0	0	21,055

## Appendix B: Detailed Tabulations of Member Data

**Table B-2: The Number and Reported Compensation of Active Members Distributed by Age as of December 31, 2013**

Age	Men		Women	
	Number	Compensation	Number	Compensation
28	1	\$ 20,659		
30	3	50,870		
31	1	20,659		
32	2	39,763	1	\$ 20,659
34	2	41,318		
35	1	20,659	1	20,659
36	2	41,318		
37	1	20,659		
38	1	20,659		
39	2	24,213		
40	3	61,977		
41			1	20,659
42	4	82,636		
43	3	61,977		
44	2	41,318		
45	6	115,346		
46	2	41,318	1	20,659
47	2	41,318		
48	1	20,659		
49	1	20,659		
50	3	61,977		
51	2	41,318	1	20,659
52	4	82,636		
53	1	55,107	1	20,659
54	2	41,318	1	20,659
55	2	41,318	3	61,977
56	4	82,636		
57	7	148,007	2	40,206
58	5	111,963	1	20,659
59	7	144,613		
60	3	61,977		
61	2	75,766	2	41,318
62	7	144,613	5	103,295
63	7	155,580	1	20,659
64	3	61,977	3	61,532
65	5	103,295		
66	4	82,636	2	41,318
67	3	66,358	1	20,659
68	3	61,977	1	20,659
69	4	82,636	2	41,318

## Appendix B: Detailed Tabulations of Member Data

**Table B-2: The Number and Reported Compensation of Active Members Distributed by Age as of December 31, 2013 (continued)**

Age	Men		Women	
	Number	Compensation	Number	Compensation
70	1	\$ 20,659	4	\$ 82,636
71	2	41,318	1	20,659
72	3	61,977		
73	2	41,318		
74	3	61,977	1	20,659
75	1	20,659		
77	1	31,532	1	20,659
81	1	20,659		
83	1	20,659		
Total	133	\$ 2,816,451	37	\$ 762,826

## Appendix B: Detailed Tabulations of Member Data

**Table B-3: The Number and Reported Compensation of Active Members Distributed by Service as of December 31, 2013**

Service	Men		Women	
	Number	Compensation	Number	Compensation
0	3	\$ 32,210		
1	41	847,017	13	\$ 267,011
2	2	41,318		
3	35	733,937	4	82,636
4	2	41,318	1	20,659
5	8	165,272	2	41,318
6	1	20,658	1	20,658
7	5	141,141	6	123,954
8	1	12,051		
9	10	210,971	2	41,318
11	7	144,613	3	61,977
12	1	20,659		
13	6	169,369	1	20,659
15	3	61,977		
17	2	45,605	1	20,659
19			2	41,318
23	2	41,318		
25	1	20,659	1	20,659
32	1	25,040		
33	2	41,318		
Total	133	\$ 2,816,451	37	\$ 762,826

## Appendix B: Detailed Tabulations of Member Data

**Table B-4: The Number and Deferred Retirement Allowance of Terminated Vested Members Distributed by Age as of December 31, 2013**

Age	Men		Women	
	Number	Allowance	Number	Allowance
39	1	\$ 4,983		
43			1	\$ 4,983
46	1	6,644		
47	1	9,966	1	4,983
48	1	10,234	1	4,983
49	2	13,288		
50	2	11,350	1	8,651
51	2	16,311		
53	3	18,963		
54	2	16,333	3	36,057
55	1	10,217		
56	2	19,378	1	4,983
57	3	20,762		
58	2	18,824		
60	2	16,610	1	8,305
61	1	4,983		
63	1	15,494		
64	1	9,966		
65	1	4,983		
67	1	15,979		
74	1	18,780		
Total	31	\$ 264,048	9	\$ 72,945

## Appendix B: Detailed Tabulations of Member Data

**Table B-5: The Number and Accumulated Contributions of Non-Vested Terminated Members Distributed by Age as of December 31, 2013**

Age	Men		Women	
	Number	Contributions	Number	Contributions
38	1	\$ 4,199		
40	1	3,068		
41	2	9,976		
42	1	1,605		
43	1	4,811		
45			1	\$ 7,471
46	2	12,734		
47	1	6,387		
48			1	513
49	1	3,068		
50	1	4,051		
51	1	6,908		
52	1	3,897		
54	1	6,387		
55	1	9,959		
56	2	14,636	1	4,837
57	1	4,051	1	3,318
58	3	20,000		
59	1	4,199		
60	2	9,293		
61	3	17,297		
62	1	6,908		
63	4	10,759	1	4,542
64	2	11,399		
65	3	17,304		
67	1	2,963	2	5,079
68	1	3,379	1	340
69	1	4,912		
70	2	15,012		
74	2	16,324		
80	1	10,150		
91	1	11,047		
Total	46	\$ 256,683	8	\$ 26,100

## Appendix B: Detailed Tabulations of Member Data

**Table B-6: The Number and Annual Retirement Allowances of Retired Members and Survivors of Deceased Members Distributed by Age as of December 31, 2013**

Age	Men		Women	
	Number	Allowances	Number	Allowances
43	1	\$ 10,128		
46			2	\$ 14,820
51			3	11,676
57			1	1,884
59			1	7,092
60	2	38,160		
61	4	36,648	2	6,492
62	2	5,508		
63	2	16,320		
64	4	31,680	6	28,992
65	7	52,272	1	20,736
66	4	61,620	5	18,564
67	7	74,700	4	31,944
68	9	79,332	5	34,632
69	7	56,448	4	26,052
70	8	46,584	5	40,368
71	10	79,812	4	20,964
72	10	77,820	2	9,696
73	6	27,960	3	16,200
74	4	28,980	4	36,564
75	7	48,636	2	19,836
76	6	55,630	5	51,780
77	13	109,968	3	31,116
78	7	58,896	4	28,680
79	9	112,104	2	17,556
80	6	47,772	4	25,596
81	10	53,400	5	41,628
82	4	31,980	5	42,240
83	7	54,408	3	24,768
84	7	72,696	3	16,836
85	3	7,056	3	12,756
86	7	58,284	3	12,036
87	7	46,860	4	14,532
88	6	37,248	3	26,124
89	1	23,412	4	27,180

## Appendix B: Detailed Tabulations of Member Data

**Table B-6: The Number and Annual Retirement Allowances of Retired Members and Survivors of Deceased Members Distributed by Age as of December 31, 2013 (continued)**

Age	Men		Women	
	Number	Allowances	Number	Allowances
90	5	\$ 57,504		
91	3	43,116	3	\$ 44,076
92	2	1,140		
93			1	7,548
94			1	8,328
95			1	5,304
96			1	6,540
98			1	480
100			1	408
Total	197	\$ 1,644,082	114	\$ 792,024



## Appendix B: Detailed Tabulations of Member Data

**Table B-7: The Number and Annual Retirement Allowances of Retired Members and Survivors of Deceased Members Distributed by Annuity Type as of December 31, 2013**

Annuity Type	Men		Women	
	Number	Allowances	Number	Allowances
Maximum	83	\$ 733,309	42	\$ 366,549
Option 1	5	27,383	2	10,009
Option 2	95	724,100	5	26,835
Option 3	11	113,581		
Option 4				
Option 5-2				
Option 5-3				
Option 6-2	1	25,591		
Option 6-3				
Other				
Survivors of Deceased Members	2	20,118	65	388,631
Total	197	\$ 1,644,082	114	\$ 792,024

## Appendix C: Summary of Main Benefit and Contribution Provisions

All members of the General Assembly are eligible for membership.

"Compensation" means salary and expense allowance paid for service as a legislator in the General Assembly, exclusive of travel and per diem. "Highest annual compensation" means the 12 consecutive calendar months of compensation during a member's final legislative term for the highest position that a member held as a member of the General Assembly. "Creditable service" includes all service rendered as a member of the General Assembly.

### BENEFITS

#### Service Retirement Allowance

##### Conditions for Allowance

A service retirement allowance is payable to any member who retires from service and:

- (a) has attained age 50 and completed 20 or more years of creditable service; or
- (b) has attained age 60 and completed five or more years of creditable service.

##### Unreduced Allowance

An unreduced annual service retirement allowance is payable to a member who has attained age 65 and completed five years of creditable service.

The Service Retirement Allowance is equal to 4.02% of a member's highest annual compensation multiplied by the number of years of creditable service.

##### Reduced Allowance

A reduced annual service retirement allowance is payable to a member who retires from service after attaining age 60 and completing five years of creditable service.

The reduced amount is an allowance as computed above reduced by 1/4% for each month that the member's retirement date precedes the date upon which the member would have attained age 65 had he remained in service.

### OR

A reduced annual service retirement allowance is payable to a member who retires from service after attaining age 50 and completing 20 years of creditable service.

## Appendix C: Summary of Main Benefit and Contribution Provisions

	<p>The reduced amount is an allowance as computed above reduced by <math>\frac{5}{12}</math> of 1% for each month that the member's retirement date precedes the date upon which the member would have attained age 60, plus <math>\frac{1}{4}\%</math> for each month that the member's retirement date precedes the date upon which the member would have attained age 65.</p>
Maximum Amount	<p>The maximum annual service retirement allowance (on an unreduced basis) is 75% of the member's highest annual compensation.</p>
Disability Retirement Allowance	
Condition for Allowance	<p>Any member who becomes permanently and totally disabled prior to the attainment of age 60 and who has completed at least five years of creditable service may be retired by the Board of Trustees on a disability retirement allowance.</p>
Amount of Allowance	<p>The disability retirement allowance is computed as an unreduced service retirement allowance based on the number of years of creditable service the member would have had had he remained in service to age 60.</p>
Deferred Allowance	<p>Any member who separates from service after completing five years of creditable service and who leaves his total accumulated contributions in the system may receive a deferred allowance, beginning at age 50, computed in the same way as a service retirement allowance on the basis of his creditable service and compensation to the date of separation.</p>
Return of Contributions	<p>Upon the withdrawal of a member without a retirement allowance and upon his request, the member's contributions are returned, together with accumulated regular interest.</p> <p>Upon the death of a member before retirement, his contributions, together with the full accumulated regular interest thereon, are paid to his estate or to person(s) designated by the member unless the designated beneficiary, if eligible, elects the survivor's alternate benefit described below.</p> <p>The current interest rate on member contributions is 4%.</p>

## Appendix C: Summary of Main Benefit and Contribution Provisions

### Survivor's Alternate Benefit

Upon the death of a member in service who has met conditions (a) or (b) below, his designated beneficiary may elect to receive a benefit equal to that which would have been payable under the provisions of Option 2 had the member retired on the first day of the month following his death and elected such option, in lieu of the member's accumulated contributions, provided the member had not instructed the Board of Trustees in writing that he did not wish the alternate benefit to apply.

- (a) attainment of age 60 and completion of five years of creditable service;
- (b) completion of 12 years of creditable service.

### Lump Sum Death Benefit

Upon the death of a member in active service after completing one year of creditable service, a lump sum payment equal to the deceased members highest annual compensation to a maximum of \$15,000 is made to his designated beneficiary or estate.

### Death After Retirement

Upon the death of a beneficiary who did not retire under an effective election of Option 2 or Option 3, an amount equal to the excess if any, of his accumulated contributions at retirement over the retirement allowance payments received is paid to a designated person or to the beneficiary's estate.

Upon the death of the survivor of a beneficiary who retired under an effective election of Option 2 or Option 3, an amount equal to the excess, if any, of the beneficiary's accumulated contributions at retirement over the total retirement allowance payments received is paid to such other person designated by the beneficiary or to the beneficiary's estate.

### Optional Arrangements at Retirement

In lieu of the full retirement allowance, any member may elect to receive a reduced retirement allowance equal in value to the full allowance, with the provision that:

Option 1 - A member retiring prior to July 1, 1993, may elect that at his death within 10 years from his retirement date, an amount equal to his accumulated contributions at retirement, less 1/120 for each month he has received a retirement

## Appendix C: Summary of Main Benefit and Contribution Provisions

	allowance, is paid to his estate, or to a person(s) designated by the member, or
	Option 2 - At the death of the member his allowance shall be continued throughout the life of such other person as the member shall have designated at the time of his retirement, or
	Option 3 - At the death of the member one-half of his allowance shall be continued throughout the life of such other person as the member shall have designated at the time of his retirement.
Post-Retirement Increases in Allowance	Future increases in allowances may be granted at the discretion of the State.
Contributions	
Member Contributions	Each member contributes 7% of his annual compensation.
Employer Contributions	<p>The State makes annual contributions consisting of a normal contribution and an accrued liability contribution. The normal contribution covers the liability on account of current service and is determined by the actuary after each valuation.</p> <p>The accrued liability contribution covers the liability on account of service rendered before the establishment of the retirement system and the liability on account of increases in benefits for service rendered prior to the effective date of any amendment.</p>
Changes Since Prior Valuation	A 1% cost-of-living adjustment was granted at July 1, 2014. The return of contributions with accumulated interest is allowed for members terminating with less than five years of membership service.

## Appendix D: Actuarial Assumptions and Methods

The next experience investigation will be based on the five-year period ending December 31, 2014. The actuary will present this investigation during the fall of 2015 for adoption by the Board of Trustees. New actuarial standards indicate that the impact of possible future mortality improvements should be incorporated in actuarial valuations. It was beyond the scope of this project to evaluate the impact that such a modification in assumptions might have.

**Interest Rate:** 7.25% per annum compounded annually.

**Inflation:** Both general and wage inflation are assumed to be 3.00% per annum.

**Real Wage Growth:** 0.50% per annum.

**Withdrawal:** No termination of employment is assumed to occur prior to retirement, other than death or disability.

**Annual Rate of Salary Increase:** 7.50%.

**Separations Before Retirement:** Representative values of the assumed annual rates of separation are as follows:

Annual Rate of			
Age	Disability	Mortality	
		Male	Female
25	.0001	.0006	.0006
30	.0004	.0008	.0008
35	.0010	.0011	.0011
40	.0029	.0016	.0016
45	.0049	.0029	.0029
50	.0084	.0053	.0053
55	.0144	.0085	.0085
60		.0131	.0131
64		.0192	.0192

**Service Retirement:** 100% of members are assumed to retire at the later of age 65 and five years of service.

## Appendix D: Actuarial Assumptions and Methods

Representative values of the assumed post-retirement mortality rates are as follows:

Annual Rate of Death after Retirement (Retired Members and Survivors of Deceased Members)						
Age	Retirees (Healthy at Retirement)		Survivors of Deceased Members		Retirees (Disabled at Retirement)	
	Male	Female	Male	Female	Male	Female
55	.0085	.0085	.0085	.0085	.0531	.0531
60	.0131	.0131	.0131	.0131	.0643	.0643
65	.0213	.0213	.0213	.0213	.0697	.0697
70	.0361	.0361	.0361	.0361	.0361	.0361
75	.0553	.0553	.0553	.0553	.0553	.0553
80	.0874	.0874	.0874	.0874	.0874	.0874

**Deaths After Retirement (Non-Disabled):** According to the 1971 Group Annuity Mortality Table for males.

**Deaths Prior to Retirement:** According to the 1971 Group Annuity Mortality Table for males.

**Timing of Assumptions:** All withdrawals, deaths, disabilities, retirements and salary increases are assumed to occur July 1 of each year.

**Liability for Inactive Members:** The liability for members who terminated prior to five years of creditable service is estimated to be 100% of the member's accumulated contributions. The liability for members who terminated after completing five years of creditable service is estimated based on the member's current age and the service and reported compensation at termination of employment.

**Administrative Expenses:** None.

**Reported Compensation:** Calendar year compensation as furnished by the system's office.

**Valuation Compensation:** Reported compensation adjusted to reflect the assumed rate of pay as of the valuation date.

**Actuarial Cost Method:** Projected unit credit. Projected benefits and the corresponding liabilities are allocated based on proration by creditable service.

**Asset Valuation Method:** The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected actuarial value of assets, based on the assumed valuation rate of return. The amount recognized each year is 20% of the difference between market value and expected actuarial value.

**Changes Since Prior Valuation:** None.

# Appendix E: GASB 67 Fiduciary Net Position Projection

**Table E-1: Projection of Fiduciary Net Positions**  
(in thousands)

Year	Beginning Fiduciary Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Investment Earnings	Ending Fiduciary Position
12/31/2013	\$ 29,542	\$ 262	\$ 47	\$ 2,813	\$ 10	\$ 2,063	\$ 29,091
12/31/2014	29,091	226	0	2,710	8	2,029	28,628
12/31/2015	28,628	231	0	2,662	7	1,996	28,186
12/31/2016	28,186	219	0	2,561	6	1,966	27,804
12/31/2017	27,804	220	0	2,552	6	1,939	27,405
12/31/2018	27,405	189	0	2,451	5	1,911	27,049
12/31/2019	27,049	194	0	2,372	5	1,888	26,754
12/31/2020	26,754	190	0	2,345	4	1,867	26,462
12/31/2021	26,462	187	0	2,344	4	1,845	26,146
12/31/2022	26,146	176	0	2,282	3	1,823	25,860
12/31/2023	25,860	177	0	2,244	3	1,804	25,594
12/31/2024	25,594	174	0	2,207	3	1,786	25,344
12/31/2025	25,344	176	14	2,187	3	1,769	25,113
12/31/2026	25,113	175	33	2,162	3	1,754	24,910
12/31/2027	24,910	172	48	2,126	2	1,740	24,742
12/31/2028	24,742	172	67	2,111	2	1,729	24,597
12/31/2029	24,597	171	83	2,032	2	1,722	24,539
12/31/2030	24,539	177	119	1,961	2	1,722	24,594
12/31/2031	24,594	183	159	1,936	2	1,728	24,726
12/31/2032	24,726	185	176	1,956	2	1,738	24,867
12/31/2033	24,867	182	179	2,094	2	1,743	24,875
12/31/2034	24,875	166	142	2,072	1	1,741	24,851
12/31/2035	24,851	164	148	2,115	1	1,738	24,785
12/31/2036	24,785	157	145	2,218	1	1,729	24,597
12/31/2037	24,597	142	121	2,157	1	1,717	24,419
12/31/2038	24,419	144	133	2,229	1	1,702	24,168
12/31/2039	24,168	132	111	2,250	1	1,681	23,841
12/31/2040	23,841	124	108	2,202	1	1,659	23,529
12/31/2041	23,529	123	114	2,160	1	1,638	23,243
12/31/2042	23,243	121	119	2,209	1	1,616	22,889
12/31/2043	22,889	110	110	2,268	0	1,586	22,427
12/31/2044	22,427	98	95	2,337	0	1,549	21,832
12/31/2045	21,832	83	74	2,212	0	1,509	21,286
12/31/2046	21,286	88	86	2,422	0	1,463	20,501
12/31/2047	20,501	59	40	2,409	0	1,404	19,595
12/31/2048	19,595	50	29	2,647	0	1,329	18,356
12/31/2049	18,356	14	0	2,502	0	1,242	17,110
12/31/2050	17,110	14	0	2,505	0	1,151	15,770
12/31/2051	15,770	0	0	2,358	0	1,059	14,471
12/31/2052	14,471	0	0	2,211	0	970	13,230
12/31/2053	13,230	0	0	2,053	0	886	12,063
12/31/2054	12,063	0	0	1,912	0	806	10,957
12/31/2055	10,957	0	0	1,773	0	731	9,915
12/31/2056	9,915	0	0	1,638	0	660	8,937
12/31/2057	8,937	0	0	1,506	0	594	8,025
12/31/2058	8,025	0	0	1,379	0	532	7,178
12/31/2059	7,178	0	0	1,256	0	476	6,398
12/31/2060	6,398	0	0	1,138	0	423	5,683
12/31/2061	5,683	0	0	1,025	0	375	5,033
12/31/2062	5,033	0	0	917	0	332	4,448



# Appendix E: GASB 67 Fiduciary Net Position Projection

**Table E-1: Projection of Fiduciary Net Positions (continued)**  
(in thousands)

Year	Beginning Fiduciary Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Investment Earnings	Ending Fiduciary Position
12/31/2063	\$ 4,448	\$ 0	\$ 0	\$ 815	\$ 0	\$ 293	\$ 3,926
12/31/2064	3,926	0	0	720	0	259	3,465
12/31/2065	3,465	0	0	630	0	229	3,064
12/31/2066	3,064	0	0	548	0	202	2,718
12/31/2067	2,718	0	0	472	0	180	2,426
12/31/2068	2,426	0	0	403	0	161	2,184
12/31/2069	2,184	0	0	341	0	146	1,989
12/31/2070	1,989	0	0	286	0	134	1,837
12/31/2071	1,837	0	0	238	0	124	1,723
12/31/2072	1,723	0	0	195	0	118	1,646
12/31/2073	1,646	0	0	159	0	113	1,600
12/31/2074	1,600	0	0	128	0	111	1,583
12/31/2075	1,583	0	0	101	0	111	1,593
12/31/2076	1,593	0	0	79	0	112	1,626
12/31/2077	1,626	0	0	61	0	116	1,681
12/31/2078	1,681	0	0	47	0	120	1,754
12/31/2079	1,754	0	0	35	0	126	1,845
12/31/2080	1,845	0	0	26	0	133	1,952
12/31/2081	1,952	0	0	19	0	141	2,074
12/31/2082	2,074	0	0	13	0	150	2,211
12/31/2083	2,211	0	0	9	0	160	2,362
12/31/2084	2,362	0	0	6	0	171	2,527
12/31/2085	2,527	0	0	4	0	183	2,706
12/31/2086	2,706	0	0	3	0	196	2,899
12/31/2087	2,899	0	0	2	0	210	3,107
12/31/2088	3,107	0	0	1	0	225	3,331
12/31/2089	3,331	0	0	1	0	241	3,571
12/31/2090	3,571	0	0	0	0	258	3,829
12/31/2091	3,829	0	0	0	0	277	4,106
12/31/2092	4,106	0	0	0	0	297	4,403
12/31/2093	4,403	0	0	0	0	319	4,722
12/31/2094	4,722	0	0	0	0	342	5,064
12/31/2095	5,064	0	0	0	0	367	5,431
12/31/2096	5,431	0	0	0	0	393	5,824
12/31/2097	5,824	0	0	0	0	422	6,246
12/31/2098	6,246	0	0	0	0	452	6,698
12/31/2099	6,698	0	0	0	0	485	7,183
12/31/2100	7,183	0	0	0	0	520	7,703
12/31/2101	7,703	0	0	0	0	558	8,261
12/31/2102	8,261	0	0	0	0	598	8,859
12/31/2103	8,859	0	0	0	0	642	9,501
12/31/2104	9,501	0	0	0	0	688	10,189
12/31/2105	10,189	0	0	0	0	738	10,927
12/31/2106	10,927	0	0	0	0	792	11,719
12/31/2107	11,719	0	0	0	0	849	12,568
12/31/2108	12,568	0	0	0	0	911	13,479
12/31/2109	13,479	0	0	0	0	977	14,456
12/31/2110	14,456	0	0	0	0	1,048	15,504
12/31/2111	15,504	0	0	0	0	1,124	16,628
12/31/2112	16,628	0	0	0	0	1,205	17,833

# Appendix E: GASB 67 Fiduciary Net Position Projection

**Table E-2: Actuarial Present Value of Projected Benefit Payments**  
(in thousands)

Year	Beginning Fiduciary Position	Benefit Payments	Funded Benefit Payments	Unfunded Benefit Payments	Present Value of Benefit Payments		
					Funded Payments at 7.25%	Unfunded Payments at 3.66%	Using Single Discount Rate of 7.25%
12/31/2013	\$ 29,542	\$ 2,813	\$ 2,813	\$ 0	\$ 2,716	\$ 0	\$ 2,716
12/31/2014	29,091	2,710	2,710	0	2,440	0	2,440
12/31/2015	28,628	2,662	2,662	0	2,235	0	2,235
12/31/2016	28,186	2,561	2,561	0	2,005	0	2,005
12/31/2017	27,804	2,552	2,552	0	1,862	0	1,862
12/31/2018	27,405	2,451	2,451	0	1,668	0	1,668
12/31/2019	27,049	2,372	2,372	0	1,505	0	1,505
12/31/2020	26,754	2,345	2,345	0	1,387	0	1,387
12/31/2021	26,462	2,344	2,344	0	1,293	0	1,293
12/31/2022	26,146	2,282	2,282	0	1,174	0	1,174
12/31/2023	25,860	2,244	2,244	0	1,076	0	1,076
12/31/2024	25,594	2,207	2,207	0	987	0	987
12/31/2025	25,344	2,187	2,187	0	912	0	912
12/31/2026	25,113	2,162	2,162	0	840	0	840
12/31/2027	24,910	2,126	2,126	0	771	0	771
12/31/2028	24,742	2,111	2,111	0	713	0	713
12/31/2029	24,597	2,032	2,032	0	640	0	640
12/31/2030	24,539	1,961	1,961	0	576	0	576
12/31/2031	24,594	1,936	1,936	0	530	0	530
12/31/2032	24,726	1,956	1,956	0	500	0	500
12/31/2033	24,867	2,094	2,094	0	499	0	499
12/31/2034	24,875	2,072	2,072	0	460	0	460
12/31/2035	24,851	2,115	2,115	0	438	0	438
12/31/2036	24,785	2,218	2,218	0	428	0	428
12/31/2037	24,597	2,157	2,157	0	388	0	388
12/31/2038	24,419	2,229	2,229	0	374	0	374
12/31/2039	24,168	2,250	2,250	0	352	0	352
12/31/2040	23,841	2,202	2,202	0	321	0	321
12/31/2041	23,529	2,160	2,160	0	294	0	294
12/31/2042	23,243	2,209	2,209	0	280	0	280
12/31/2043	22,889	2,268	2,268	0	268	0	268
12/31/2044	22,427	2,337	2,337	0	258	0	258
12/31/2045	21,832	2,212	2,212	0	227	0	227
12/31/2046	21,286	2,422	2,422	0	232	0	232
12/31/2047	20,501	2,409	2,409	0	215	0	215
12/31/2048	19,595	2,647	2,647	0	221	0	221
12/31/2049	18,356	2,502	2,502	0	194	0	194
12/31/2050	17,110	2,505	2,505	0	182	0	182
12/31/2051	15,770	2,358	2,358	0	159	0	159
12/31/2052	14,471	2,211	2,211	0	139	0	139
12/31/2053	13,230	2,053	2,053	0	121	0	121
12/31/2054	12,063	1,912	1,912	0	105	0	105
12/31/2055	10,957	1,773	1,773	0	91	0	91
12/31/2056	9,915	1,638	1,638	0	78	0	78
12/31/2057	8,937	1,506	1,506	0	67	0	67
12/31/2058	8,025	1,379	1,379	0	57	0	57
12/31/2059	7,178	1,256	1,256	0	48	0	48
12/31/2060	6,398	1,138	1,138	0	41	0	41
12/31/2061	5,683	1,025	1,025	0	34	0	34
12/31/2062	5,033	917	917	0	29	0	29

# Appendix E: GASB 67 Fiduciary Net Position Projection

**Table E-2: Actuarial Present Value of Projected Benefit Payments**  
(continued)  
(in thousands)

Year	Beginning Fiduciary Position	Benefit Payments	Funded Benefit Payments	Unfunded Benefit Payments	Present Value of Benefit Payments		
					Funded Payments at 7.25%	Unfunded Payments at 3.66%	Using Single Discount Rate of 7.25%
12/31/2063	\$ 4,448	\$ 815	\$ 815	\$ 0	\$ 24	\$ 0	\$ 24
12/31/2064	3,926	720	720	0	20	0	20
12/31/2065	3,465	630	630	0	16	0	16
12/31/2066	3,064	548	548	0	13	0	13
12/31/2067	2,718	472	472	0	10	0	10
12/31/2068	2,426	403	403	0	8	0	8
12/31/2069	2,184	341	341	0	7	0	7
12/31/2070	1,989	286	286	0	5	0	5
12/31/2071	1,837	238	238	0	4	0	4
12/31/2072	1,723	195	195	0	3	0	3
12/31/2073	1,646	159	159	0	2	0	2
12/31/2074	1,600	128	128	0	2	0	2
12/31/2075	1,583	101	101	0	1	0	1
12/31/2076	1,593	79	79	0	1	0	1
12/31/2077	1,626	61	61	0	1	0	1
12/31/2078	1,681	47	47	0	0	0	0
12/31/2079	1,754	35	35	0	0	0	0
12/31/2080	1,845	26	26	0	0	0	0
12/31/2081	1,952	19	19	0	0	0	0
12/31/2082	2,074	13	13	0	0	0	0
12/31/2083	2,211	9	9	0	0	0	0
12/31/2084	2,362	6	6	0	0	0	0
12/31/2085	2,527	4	4	0	0	0	0
12/31/2086	2,706	3	3	0	0	0	0
12/31/2087	2,899	2	2	0	0	0	0
12/31/2088	3,107	1	1	0	0	0	0
12/31/2089	3,331	1	1	0	0	0	0
12/31/2090	3,571	0	0	0	0	0	0
12/31/2091	3,829	0	0	0	0	0	0
12/31/2092	4,106	0	0	0	0	0	0
12/31/2093	4,403	0	0	0	0	0	0
12/31/2094	4,722	0	0	0	0	0	0
12/31/2095	5,064	0	0	0	0	0	0
12/31/2096	5,431	0	0	0	0	0	0
12/31/2097	5,824	0	0	0	0	0	0
12/31/2098	6,246	0	0	0	0	0	0
12/31/2099	6,698	0	0	0	0	0	0
12/31/2100	7,183	0	0	0	0	0	0
12/31/2101	7,703	0	0	0	0	0	0
12/31/2102	8,261	0	0	0	0	0	0
12/31/2103	8,859	0	0	0	0	0	0
12/31/2104	9,501	0	0	0	0	0	0
12/31/2105	10,189	0	0	0	0	0	0
12/31/2106	10,927	0	0	0	0	0	0
12/31/2107	11,719	0	0	0	0	0	0
12/31/2108	12,568	0	0	0	0	0	0
12/31/2109	13,479	0	0	0	0	0	0
12/31/2110	14,456	0	0	0	0	0	0
12/31/2111	15,504	0	0	0	0	0	0
12/31/2112	16,628	0	0	0	0	0	0