



# National Guard Pension Fund Principal Results of Actuarial Valuation as of December 31, 2015

Board of Trustees Meeting  
Larry Langer and Mike Ribble  
October 27, 2016

# National Guard Pension Fund

## Principal Results of December 31, 2015 Valuation

Valuation results as of	12/31/2015	12/31/2014
Active Members		
Number	5,756	5,661
Retired Members Currently Receiving Benefits		
Number	4,484	4,421
Annual Pensions	\$ 8,398,865	\$ 8,299,998
Terminated Members Entitled to but Not Yet Receiving Benefits		
Number	5,512	5,317
Deferred Pensions	\$ 9,469,908	\$ 9,081,954
Assets		
Actuarial Value (AVA)	\$ 113,094,394	\$ 109,291,873
Market Value	\$ 107,064,124	\$ 108,937,947
Actuarial Accrued Liability (AAL)	\$ 168,689,943	\$ 151,066,064
Unfunded Accrued Liability (AAL-AVA)	\$ 55,595,549	\$ 41,774,191
Funded Ratio (AVA/AAL)*	67.0%	72.3%

\* The funded ratio on a market value of assets basis is 63.5% at December 31, 2015.

# National Guard Pension Fund

## Principal Results of December 31, 2015 Valuation

Contributions for Fiscal Year Ending	6/30/2018	6/30/2017
Actuarially Determined Employer Contribution (ADEC)		
Normal Cost	\$ 381,477	\$ 572,610
Accrued Liability	<u>8,541,676</u>	<u>6,349,473</u>
Total	\$ 8,923,153	\$ 6,922,083
Impact of Experience Study	NA	\$ 1,594,990
Impact of Legislative Changes	<u>NA</u>	<u>0</u>
Final ADEC	NA	\$ 8,517,073

# Certification

The assumptions, methods, and plan provisions used in the results presented in this presentation were provided in October 2016 in the “Report on the Actuarial Valuation of the North Carolina National Guard Pension Fund prepared as of December 31, 2015”.

The results were prepared under the direction of Michael Ribble and Larry Langer who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about them.

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.

Michael A. Ribble, FSA, EA, MAAA  
Principal, Consulting Actuary

Larry Langer, ASA, EA, MAAA  
Principal, Consulting Actuary

Questions?

**THANK YOU**

# North Carolina National Guard Pension Fund

Report on the Actuarial Valuation  
Prepared as of December 31, 2015

October 2016



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October 13, 2016

Board of Trustees  
Teachers' and State Employees'  
Retirement System of North Carolina  
3200 Atlantic Avenue  
Raleigh, NC 27604

Members of the Board:

We submit herewith our report on the actuarial valuation of the National Guard Pension Fund of North Carolina (referred to as "the Fund") prepared as of December 31, 2015. The report has been prepared in accordance with Chapter 127A of the North Carolina General Statutes.

The primary purpose of the valuation report is to determine the required employer contribution rates, to describe the current financial condition of the Fund, 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. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without prior review.

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 appropriate and reasonable and also comply with the requirements of GASB Statement No. 67. We prepared this valuation in accordance with the requirements of this standard and in accordance with all applicable Actuarial Standards of Practice (ASOP).

The latest assumptions were adopted for use with the December 31, 2015 actuarial valuation, based on the experience study prepared as of December 31, 2014 and adopted by the Board of Trustees on January 21, 2016. The economic assumptions with respect to investment yield, salary increase and inflation have been based upon a review of the existing portfolio structure as well as recent and anticipated experience.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities. In various places in the report the results also show funded ratios and unfunded liabilities based upon varying sets of assumptions as well as market values of assets as that is required for certain disclosure information required per accounting rules or statutes. Where this has been done it has been clearly indicated.

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, except for some limited analysis in financial projections or required disclosure information.

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,



Michael A. Ribble, FSA, EA, MAAA  
Principal, Consulting Actuary



Larry Langer, ASA, EA, MAAA  
Principal, Consulting Actuary

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# Section 1: Summary of Principal Results

1. This report, prepared as of December 31, 2015, presents the results of the actuarial valuation of the Fund. For convenience of reference, 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	12/31/2015	12/31/2014
Active Members		
Number	5,756	5,661
Retired Members Currently Receiving Benefits		
Number	4,484	4,421
Annual Pensions	\$ 8,398,865	\$ 8,299,998
Terminated Members Entitled to but Not Yet Receiving Benefits		
Number	5,512	5,317
Deferred Pensions	\$ 9,469,908	\$ 9,081,954
Assets		
Actuarial Value (AVA)	\$ 113,094,394	\$ 109,291,873
Market Value	\$ 107,064,124	\$ 108,937,947
Actuarial Accrued Liability (AAL)	\$ 168,689,943	\$ 151,066,064
Unfunded Accrued Liability (AAL-AVA)	\$ 55,595,549	\$ 41,774,191
Funded Ratio (AVA/AAL)*	67.0%	72.3%
Contributions for Fiscal Year Ending	6/30/2018	6/30/2017
Actuarially Determined Employer Contribution (ADEC)		
Normal Cost	\$ 381,477	\$ 572,610
Accrued Liability	<u>8,541,676</u>	<u>6,349,473</u>
Total	\$ 8,923,153	\$ 6,922,083
Impact of Experience Study	NA	\$ 1,594,990
Impact of Legislative Changes	<u>NA</u>	<u>0</u>
Final ADEC	NA	\$ 8,517,073

\* The Funded Ratio on a Market Value of Assets basis is 63.5% at December 31, 2015.

## Section 1: Summary of Principal Results

2. The following table shows a reconciliation of the change in the actuarially determined employer contribution computed to be \$6,922,083 based on the December 31, 2014 valuation and \$8,923,153 based on the December 31, 2015 valuation.

**Table 2: Reconciliation of Change in Actuarially Determined Employer Contribution (ADEC)**

Fiscal year ending June 30, 2017 Preliminary ADEC (based on December 31, 2014 valuation)	\$ 6,922,083
Impact of Experience Study	1,594,990
Impact of Legislative Changes	<u>0</u>
Fiscal year ending June 30, 2017 Final ADEC	\$ 8,517,073
Change Due to Demographic (Gain)/Loss	199,795
Change Due to Investment (Gain)/Loss	206,285
Change Due to Contributions Greater than ADEC	<u>0</u>
Fiscal year ending June 30, 2018 Preliminary ADEC (based on December 31, 2015 valuation)	\$ 8,923,153

## Section 1: Summary of Principal Results

3. Tables summarizing the membership of the Fund as of the valuation date are shown in Section 2.
4. The valuation balance sheet showing the assets and liabilities of the Fund as of the current and previous valuation dates is provided in Section 3.
5. An allocation of investments by category is shown in Section 4.
6. Comments on the experience and actuarial gains/losses during the valuation year are provided in Section 5.
7. Comments on the actuarially determined employer contribution are provided in Section 6.
8. Accounting information to be disclosed in the financial statements of the Plan is provided in Section 7.
9. Appendix A of this report presents the development of the actuarial value of assets.
10. Appendix B of this report presents the development of the amortization of the unfunded accrued liability.
11. Appendix C of this report outlines the full set of actuarial assumptions and methods employed.
12. Appendix D gives a summary of the benefit provisions of the system.
13. Appendix E provides the projection of cash flows used to determine the discount rate under GASB Statement No. 67.
14. Appendix F provides detailed tabulations of the membership of the system as of the valuation date.

## Section 2: Membership Data

Data regarding the membership of the Fund for use as a basis for the valuation were furnished by the Retirement Systems Division. The following table summarizes the membership of the Fund as of December 31, 2015 upon which the valuation was based. Detailed tabulations of the data are given in Appendix F.

**Table 3: Membership of the Fund as of December 31, 2015**

	Member Count	Average Age	Average Service	Annual Pensions
Active Members	5,756	37.60	15.13	N/A
Retired Members Currently Receiving Benefits	4,484	70.48	N/A	\$ 8,398,865
Terminated Members Entitled to Benefits but Not Yet Receiving Benefits	5,512	56.55	N/A	\$ 9,469,908

## Section 3: Valuation Balance Sheet

The following valuation balance sheet shows the assets and liabilities of the Retirement Fund as of the current valuation date of December 31, 2015. Appendix A summarizes the development of the actuarial value of assets

**Table 4: Valuation Balance Sheet Showing the Present and Prospective Assets and Liabilities of the North Carolina National Guard Pension Fund Prepared as of December 31, 2015**

<b>Assets</b>		
Present Assets		\$ 113,094,394
Present Value of Prospective Contributions Payable by State		
Normal Contribution	\$ 1,511,206	
Accrued Liability Contribution	<u>\$ 55,595,549</u>	
Total Prospective Contributions by State		<u>\$ 57,106,755</u>
Total Assets		<u><u>\$ 170,201,149</u></u>
<b>Liabilities</b>		
Present Value of Pensions Payable to Retired Members Currently Receiving Benefits		\$ 74,795,420
Present Value of Deferred Pensions Payable to Terminated Members Entitled to Benefits but Not Yet Receiving Benefits		\$ 70,761,140
Present Value of Prospective Pensions to Active Members Included in the Valuation		\$ 24,644,589
Reserve for Increases in Retirement Allowances		<u>\$ 0</u>
Total Liabilities		<u><u>\$ 170,201,149</u></u>

The valuation balance sheet shows that the total present value of the prospective benefit payments as of December 31, 2015 amounts to \$170,201,149. Of this amount, \$74,795,420 represents the present value of future pension payments to retired members currently receiving benefits, \$24,644,589 represents the present value of prospective pensions which will become payable to present active members and \$70,761,140 represents the present value of future pension payments to terminated members entitled to benefits but not yet receiving benefits. Against these liabilities, the Fund has assets of \$113,094,394 leaving a balance of \$57,106,755 to be provided by future contributions of the State. Of this amount, \$1,511,206 represents the present value of prospective normal contributions, and the balance of \$55,595,549 represents the present value of accrued liability contributions.

## Section 4: Asset Allocation

The following table shows an allocation of investments by category as of December 31, 2015.

**Table 5: Allocation of Investments by Category for the National Guard Pension Fund as of December 31, 2015**

Cash and Receivables	2.2%
Fixed Income (LTIF)	28.1%
Public Equity	42.4%
Other*	<u>27.3%</u>
Total	100.0%

\* Real Estate, Alternatives, Inflation and Credit.

## Section 5: Comments on Experience and Gains/Losses

The following table shows a detailed reconciliation of the change in unfunded accrued liability since the prior valuation.

**Table 6: Reconciliation of Change in Unfunded Accrued Liability Since the Prior Valuation**  
(in millions)

Unfunded Actuarial Accrued Liability (UAAL) as of 12/31/2014	\$	41.8
Impact of Experience Study		13.4
Normal Cost during 2015		0.3
Reduction due to Actual Contributions during 2015		(6.0)
Interest on UAAL, Normal Cost, and Contributions		3.8
Asset (Gain)/Loss		1.5
Actuarial Accrued Liability (Gain)/Loss		0.8
Impact of Legislative Changes		<u>0.0</u>
Unfunded Actuarial Accrued Liability (UAAL) as of 12/31/2015	\$	55.6

**Commentary:** The changes in assumptions and methods from the experience study increased the unfunded actuarial accrued liability (UAAL) by \$13.4 million at December 31, 2014.

## Section 6: Actuarially Determined Employer Contribution

The normal contribution covers the cost of benefits based on current service. The valuation indicates that the annual normal contribution payable by the State is equal to \$51.16 multiplied by the number of active members. Based on 5,756 active members included in the valuation, the normal contribution is \$294,477.

The unfunded actuarial accrued liability is amortized within a 12-year period through an annual unfunded accrued liability contribution. Assuming that the unfunded accrued liability is amortized based on the amortization schedule shown in Appendix B, with the payments covering both the principal amount and the accruing interest thereon at the rate of 7.25% per annum, the annual unfunded actuarial accrued liability contribution would be \$8,541,676.

Based on the present membership and the amortization schedule described above, the following table shows the total annual contributions payable by the State for the fiscal year ending June 30, 2018.

**Table 7: Actuarially Determined Employer Contribution**

Contribution	Annual Amount
Normal Cost*	\$ 381,477
Accrued Liability	<u>8,541,676</u>
Total	\$ 8,923,153

\* Includes assumed administrative expenses equal to prior year's actual administrative expenses of \$87,000

## Section 7: Accounting Information

The section contains the accounting information for Governmental Accounting Standards Board (GASB) Statement No. 67 for fiscal year ending June 30, 2016 based on a valuation date of December 31, 2015.

Please note that GASB Statement No. 67 (*Financial Reporting for Pension Plans*) is *applicable* for fiscal years ending 2014 and later.

The June 30, 2016 total pension liability presented in this section was determined by an actuarial valuation as of December 31, 2015, based on the assumptions, methods and plan provisions described in this report. The actuarial cost method used to develop the total pension liability is the Entry Age Normal Cost method, as required by GASB Statement No. 67.

GASB Statement No. 67 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.

**Table 8: Number of Active and Retired Members  
as of December 31, 2015**

Group	Number
Retired members and survivors of deceased members currently receiving benefits	4,484
Terminated members and survivors of deceased members entitled to benefits but not yet receiving benefits	5,512
Active participants	<u>5,756</u>
Total	15,752

## Section 7: Accounting Information

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

Calculation as of	June 30, 2016
<b>Total Pension Liability</b>	
Service Cost	\$ 593,000
Interest	10,700,000
Changes of Benefit Terms	0
Difference between Expected and Actual Experience	30,000
Change of Assumptions	15,149,000
Benefit Payments, including Refund of Member Contributions	(8,512,000)
Net Change in Total Pension Liability	\$ 17,960,000
Total Pension Liability - Beginning of Year	\$ 151,250,000
Total Pension Liability - End of Year	\$ 169,210,000
<b>Plan Fiduciary Net Position</b>	
Employer Contributions	\$ 7,066,000
Member Contributions	0
Net Investment Income	842,000
Benefit Payments, including Refund of Member Contributions	(8,512,000)
Administrative Expenses	(97,000)
Other	1,000
Net Change in Fiduciary Net Position	\$ (700,000)
Plan Fiduciary Net Position - Beginning of Year	\$ 110,529,000
Plan Fiduciary Net Position - End of Year	\$ 109,829,000

**Table 10: Net Pension Liability (Asset)**

Calculation as of	June 30, 2016	June 30, 2015
Total Pension Liability	\$ 169,210,000	\$ 151,250,000
Plan Fiduciary Net Position	109,829,000	110,529,000
Net Pension Liability (Asset)	\$ 59,381,000	\$ 40,721,000
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	64.91%	73.08%

## Section 7: Accounting Information

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

**Table 11: Sensitivity of the Net Pension Liability (Asset)  
at June 30, 2016 to Changes in the Discount Rate**

	1% Decrease	Current	1% Increase
Discount Rate	6.25%	7.25%	8.25%
Net Pension Liability (Asset)	80,176,000	59,381,000	42,267,000

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.

The table below provides the methods and assumptions used to calculate the actuarially determined employer contribution rate.

**Table 12: Additional Information for GASB Statement No. 67**

Valuation Date	12/31/2015
Actuarial Cost Method	Entry Age
Amortization Method	Level dollar closed
Amortization Period	12 years
Asset Valuation Method	Asset returns in excess of or less than the expected return on market value of assets reflected over a five-year period (not greater than 120% of market value and not less than 80% of market value)
Actuarial Assumptions	
Investment Rate of Return*	7.25%
Projected Salary Increases	N/A
* Includes Inflation of	3.00%
Cost-of-living Adjustments	N/A

## Appendix A: Development of Actuarial Value of Assets

Asset Data as of	12/31/2015
Beginning of Year Market Value of Assets	\$ 108,937,947
Contributions	6,039,274
Benefit Payments	(8,195,111)
Net Cash Flow	(2,155,837)
Expected Investment Return	7,819,852
Expected End of Year Market Value of Assets	114,601,962
End of Year Market Value of Assets	107,064,124
Excess of Market Value over Expected Market Value of Assets	(7,537,838)
80% of 2015 Asset Gain/(Loss)	(6,030,270)
60% of 2014 Asset Gain/(Loss)	N/A
40% of 2013 Asset Gain/(Loss)	N/A
20% of 2012 Asset Gain/(Loss)	N/A
Total Deferred Asset Gain/(Loss)	(6,030,270)
Preliminary End of Year Actuarial Value of Assets	113,094,394
Final End of Year Actuarial Value of Assets (not less than 80% and not greater than 120% of Market Value)	113,094,394
Estimated Net Investment Return on Actuarial Value	5.85%
Estimated Net Investment Return on Market Value	0.26%

**Commentary:** The actuarial value of assets smooths investment gains/losses, resulting in less volatility in the employer contribution. The asset valuation method was changed during the experience study from a method that calculated the actuarial value of assets as 20% of the market value of assets plus 80% of the expected actuarial value of assets to a method that recognizes asset returns in excess of or less than the expected return on the market value of assets over a five-year period.

The new asset valuation method re-set the actuarial value of assets to the market value of assets at December 31, 2014, effective for the December 31, 2015 valuation. Lower than expected market returns in 2015 resulted in an actuarial value of asset return for calendar year 2015 of 5.85% and an asset loss of \$1.5 million during 2015.

The actuarial value of assets would have been \$113,398,063 as of December 31, 2015 under the asset method used in the prior valuation.

## Appendix B: Amortization Schedule for Unfunded Actuarial Accrued Liability

Date Established	Original Balance	12/31/2015 Outstanding Balance	Annual Payment
December 31, 2009	\$ 40,483,684	\$ 32,317,025	\$ 5,539,494
December 31, 2010	(2,911,753)	(2,551,970)	(398,423)
December 31, 2011	(2,233,723)	(2,120,514)	(305,646)
December 31, 2012	(515,855)	(524,764)	(70,586)
December 31, 2013	4,219,347	4,559,562	577,345
December 31, 2014	7,361,464	7,895,170	1,007,289
December 31, 2015	16,021,040	16,021,040	2,192,203
Total		\$ 55,595,549	\$ 8,541,676

## Appendix C: Actuarial Assumptions and Methods

Assumptions are based on the experience investigation prepared as of December 31, 2014 and adopted by the Board of Trustees on January 21, 2016 for use with the December 31, 2015 annual actuarial valuation.

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

**Active Members:** The valuation excludes all active members with less than 7 years of service.

**Separations From Active Service:** Representative values of the assumed annual rates of separation from active service are as follows:

### Annual Rates of Withdrawal\*

	<u>Service</u>			
<u>Age</u>	<u>&lt;=6</u>	<u>7-9</u>	<u>10-14</u>	<u>15-19</u>
<=24	0.000	0.150	0.080	0.050
25-29	0.000	0.150	0.080	0.050
30-34	0.000	0.150	0.080	0.050
35-39	0.000	0.150	0.080	0.050
40-44	0.000	0.150	0.080	0.050
45-49	0.000	0.150	0.080	0.050
>=50	0.000	0.150	0.080	0.050

\* Applied only to members with less than 20 years of service.

### Annual Rates of

	<u>Male</u>	<u>Female</u>	
<u>Age</u>	<u>Mortality*</u>	<u>Mortality*</u>	<u>Disability**</u>
25	.0005	.0002	.0001
30	.0005	.0002	.0004
35	.0005	.0003	.0010
40	.0006	.0004	.0029
45	.0010	.0007	.0049
50	.0017	.0011	.0084
55	.0028	.0017	.0144
60	.0047	.0024	.0240

\* Base mortality rates as of 2014.

## Appendix C: Actuarial Assumptions and Methods

### Annual Rates of Retirement

	<u>Service</u>	
<u>Age</u>	<u>&lt;=19</u>	<u>&gt;=20</u>
<=54	0.000	0.150
55-59	0.000	0.200
60-64	0.000	0.750
>=65	0.000	1.000

**Deaths After Retirement:** Representative values of the assumed post-retirement mortality rates in 2014 prior to any mortality improvements are as follows:

### Annual Rates of Death After Retirement

<u>Age</u>	<u>Male Retirees (Healthy at Retirement)</u>	<u>Female Retirees (Healthy at Retirement)</u>	<u>Male Retirees (Disabled at Retirement)</u>	<u>Female Retirees (Disabled at Retirement)</u>
55	.0057	.0036	.0234	.0145
60	.0078	.0052	.0266	.0170
65	.0110	.0080	.0317	.0209
70	.0168	.0129	.0403	.0282
75	.0268	.0209	.0543	.0410
80	.0447	.0348	.0766	.0610

**Deaths After Retirement (Healthy at Retirement):** Mortality rates are based on the RP-2014 Total Data Set for Healthy Annuitants Mortality Table.

**Death After Retirement (Disabled at Retirement):** Mortality rates are based on the RP-2014 Total Data Set for Disabled Annuitants Mortality Table.

**Deaths Prior to Retirement:** Mortality Rates are based on the RP-2014 Total Data Set Employee Mortality Table.

**Mortality Projection:** All mortality rates are projected from 2014 using generational improvement with Scale MP-2015.

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

**Administrative Expenses:** Prior year's actual administrative expenses.

**Actuarial Cost Method:** Entry age normal cost method. Entry age is established on an individual basis.

## Appendix C: Actuarial Assumptions and Methods

**Asset Valuation Method:** Actuarial value, as developed in Appendix A. Actuarial value of assets is based upon a smoothed market value method. Under this method, asset returns in excess of or less than the expected return on market value of assets will be reflected in the actuarial value of assets over a five-year period. The calculation of the Actuarial Value of Assets is based on the following formula:

$$MV - 80\% \times G/(L)_1 - 60\% \times G/(L)_2 - 40\% \times G/(L)_3 - 20\% \times G/(L)_4$$

MV = the market value of assets as of the valuation date

$G/(L)_i$  = the asset gain or (loss) for the i-th year preceding the valuation date

**Changes Since Prior Valuation:** The withdrawal rates, the retirement rates, the mortality assumption, the expense assumption, and the asset valuation method were changed based on the experience study prepared as of December 31, 2014 and adopted by the Board of Trustees on January 21, 2016.

## Appendix D: Summary of Main Plan Provisions

### Membership

All members of the North Carolina National Guard with seven years of service are eligible to be members of the Fund.

### Benefits

#### Service Retirement Pension

Condition for Pension	A member who retires after he has attained age 60 and has credit for 20 years of military service, including at least 15 years of North Carolina national guard duty, both reserve and active, and who has received an honorable discharge, is entitled to a monthly pension.
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Amount of Pension	The amount of the pension is equal to \$105 per month for 20 years of creditable service with an additional \$10.50 per month for each additional year of such service, provided that the total pension shall not exceed \$210 per month.
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#### Deferred Early Retirement Pension

Condition for Pension	A member whose service is terminated after he has credit for 20 years of military service, including at least 15 years of North Carolina national guard duty, both reserve and active, and who has received an honorable discharge, is eligible to receive a deferred retirement pension commencing at age 60.
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Amount of Pension	The amount is the same as that for a service retirement.
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Normal Form	Life Annuity.
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Optional Form	None.
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### Contributions

The State makes annual contributions sufficient to meet the cost of the benefits under the Fund.

Changes Since Prior Valuation	None.
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# Appendix E: GASB 67 Fiduciary Net Position Projection

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

Calendar Year	Beginning Fiduciary Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Investment Earnings	Ending Fiduciary Position
2016	\$ 107,064	\$ 0	\$ 6,218	\$ 11,086	\$ 90	\$ 7,577	\$ 109,683
2017	109,683	0	7,762	11,287	80	7,804	113,882
2018	113,882	0	8,941	11,472	71	8,162	119,442
2019	119,442	0	9,168	11,663	63	8,566	125,450
2020	125,450	0	9,384	11,952	57	9,000	131,825
2021	131,825	0	9,588	12,248	51	9,459	138,573
2022	138,573	0	9,676	12,556	45	9,942	145,590
2023	145,590	0	6,885	12,887	40	10,388	149,936
2024	149,936	0	4,295	13,173	35	10,549	151,572
2025	151,572	0	4,630	13,458	31	10,671	153,384
2026	153,384	0	4,802	13,623	27	10,804	155,340
2027	155,340	0	4,533	13,796	24	10,937	156,990
2028	156,990	0	3,727	13,930	20	11,027	157,794
2029	157,794	0	2,126	14,035	17	11,035	156,903
2030	156,903	0	897	14,131	14	10,906	154,561
2031	154,561	0	628	14,184	12	10,724	151,717
2032	151,717	0	377	14,138	10	10,511	148,457
2033	148,457	0	141	13,997	8	10,271	144,864
2034	144,864	0	25	13,845	6	10,011	141,049
2035	141,049	0	20	13,650	5	9,741	137,155
2036	137,155	0	17	13,415	4	9,466	133,219
2037	133,219	0	13	13,151	4	9,191	129,268
2038	129,268	0	11	12,906	3	8,912	125,282
2039	125,282	0	9	12,654	2	8,633	121,268
2040	121,268	0	7	12,410	2	8,350	117,213
2041	117,213	0	5	12,177	1	8,064	113,104
2042	113,104	0	4	11,947	1	7,775	108,935
2043	108,935	0	3	11,733	1	7,480	104,684
2044	104,684	0	2	11,497	1	7,181	100,369
2045	100,369	0	2	11,248	0	6,876	95,999
2046	95,999	0	1	10,965	0	6,570	91,605
2047	91,605	0	1	10,695	0	6,260	87,171
2048	87,171	0	0	10,460	0	5,947	82,658
2049	82,658	0	0	10,169	0	5,631	78,120
2050	78,120	0	0	9,837	0	5,314	73,597
2051	73,597	0	0	9,441	0	5,000	69,156
2052	69,156	0	0	8,996	0	4,693	64,853
2053	64,853	0	0	8,551	0	4,397	60,699
2054	60,699	0	0	8,113	0	4,112	56,698
2055	56,698	0	0	7,683	0	3,837	52,852
2056	52,852	0	0	7,263	0	3,574	49,163
2057	49,163	0	0	6,852	0	3,321	45,632
2058	45,632	0	0	6,450	0	3,078	42,260
2059	42,260	0	0	6,060	0	2,848	39,048
2060	39,048	0	0	5,681	0	2,628	35,995
2061	35,995	0	0	5,314	0	2,421	33,102
2062	33,102	0	0	4,960	0	2,223	30,365
2063	30,365	0	0	4,620	0	2,037	27,782
2064	27,782	0	0	4,293	0	1,861	25,350
2065	25,350	0	0	3,981	0	1,696	23,065

# Appendix E: GASB 67 Fiduciary Net Position Projection

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

Calendar Year	Beginning Fiduciary Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Investment Earnings	Ending Fiduciary Position
2066	\$ 23,065	\$ 0	\$ 0	\$ 3,684	\$ 0	\$ 1,541	\$ 20,922
2067	20,922	0	0	3,401	0	1,396	18,917
2068	18,917	0	0	3,132	0	1,260	17,045
2069	17,045	0	0	2,878	0	1,134	15,301
2070	15,301	0	0	2,637	0	1,015	13,679
2071	13,679	0	0	2,409	0	906	12,176
2072	12,176	0	0	2,194	0	805	10,787
2073	10,787	0	0	1,991	0	710	9,506
2074	9,506	0	0	1,801	0	626	8,331
2075	8,331	0	0	1,621	0	546	7,256
2076	7,256	0	0	1,452	0	474	6,278
2077	6,278	0	0	1,294	0	408	5,392
2078	5,392	0	0	1,147	0	351	4,596
2079	4,596	0	0	1,009	0	297	3,884
2080	3,884	0	0	882	0	250	3,252
2081	3,252	0	0	764	0	208	2,696
2082	2,696	0	0	657	0	173	2,212
2083	2,212	0	0	559	0	141	1,794
2084	1,794	0	0	470	0	113	1,437
2085	1,437	0	0	392	0	90	1,135
2086	1,135	0	0	322	0	71	884
2087	884	0	0	261	0	55	678
2088	678	0	0	208	0	41	511
2089	511	0	0	164	0	32	379
2090	379	0	0	126	0	22	275
2091	275	0	0	96	0	17	196
2092	196	0	0	71	0	12	137
2093	137	0	0	52	0	8	93
2094	93	0	0	37	0	6	62
2095	62	0	0	25	0	4	41
2096	41	0	0	17	0	2	26
2097	26	0	0	11	0	1	16
2098	16	0	0	7	0	1	10
2099	10	0	0	4	0	0	6
2100	6	0	0	3	0	1	4
2101	4	0	0	2	0	1	3
2102	3	0	0	1	0	0	2
2103	2	0	0	0	0	0	1
2104	1	0	0	0	0	0	1
2105	1	0	0	0	0	0	1
2106	1	0	0	0	0	0	1
2107	1	0	0	0	0	0	1
2108	1	0	0	0	0	1	2
2109	2	0	0	0	0	0	2
2110	2	0	0	0	0	0	2
2111	2	0	0	0	0	0	2
2112	2	0	0	0	0	0	2
2113	2	0	0	0	0	0	2
2114	2	0	0	0	0	0	2
2115	2	0	0	0	0	0	2

# Appendix E: GASB 67 Fiduciary Net Position Projection

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

Calendar 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 2.71%	Using Single Discount Rate of 7.25%
2016	\$ 107,064	\$ 11,086	\$ 11,086	\$ 0	\$ 10,705	\$ 0	\$ 10,705
2017	109,683	11,287	11,287	0	10,162	0	10,162
2018	113,882	11,472	11,472	0	9,630	0	9,630
2019	119,442	11,663	11,663	0	9,129	0	9,129
2020	125,450	11,952	11,952	0	8,723	0	8,723
2021	131,825	12,248	12,248	0	8,335	0	8,335
2022	138,573	12,556	12,556	0	7,967	0	7,967
2023	145,590	12,887	12,887	0	7,624	0	7,624
2024	149,936	13,173	13,173	0	7,266	0	7,266
2025	151,572	13,458	13,458	0	6,922	0	6,922
2026	153,384	13,623	13,623	0	6,533	0	6,533
2027	155,340	13,796	13,796	0	6,169	0	6,169
2028	156,990	13,930	13,930	0	5,807	0	5,807
2029	157,794	14,035	14,035	0	5,456	0	5,456
2030	156,903	14,131	14,131	0	5,122	0	5,122
2031	154,561	14,184	14,184	0	4,793	0	4,793
2032	151,717	14,138	14,138	0	4,455	0	4,455
2033	148,457	13,997	13,997	0	4,112	0	4,112
2034	144,864	13,845	13,845	0	3,793	0	3,793
2035	141,049	13,650	13,650	0	3,486	0	3,486
2036	137,155	13,415	13,415	0	3,195	0	3,195
2037	133,219	13,151	13,151	0	2,920	0	2,920
2038	129,268	12,906	12,906	0	2,672	0	2,672
2039	125,282	12,654	12,654	0	2,443	0	2,443
2040	121,268	12,410	12,410	0	2,234	0	2,234
2041	117,213	12,177	12,177	0	2,044	0	2,044
2042	113,104	11,947	11,947	0	1,870	0	1,870
2043	108,935	11,733	11,733	0	1,712	0	1,712
2044	104,684	11,497	11,497	0	1,564	0	1,564
2045	100,369	11,248	11,248	0	1,427	0	1,427
2046	95,999	10,965	10,965	0	1,297	0	1,297
2047	91,605	10,695	10,695	0	1,179	0	1,179
2048	87,171	10,460	10,460	0	1,076	0	1,076
2049	82,658	10,169	10,169	0	975	0	975
2050	78,120	9,837	9,837	0	879	0	879
2051	73,597	9,441	9,441	0	787	0	787
2052	69,156	8,996	8,996	0	699	0	699
2053	64,853	8,551	8,551	0	620	0	620
2054	60,699	8,113	8,113	0	548	0	548
2055	56,698	7,683	7,683	0	484	0	484
2056	52,852	7,263	7,263	0	427	0	427
2057	49,163	6,852	6,852	0	375	0	375
2058	45,632	6,450	6,450	0	329	0	329
2059	42,260	6,060	6,060	0	289	0	289
2060	39,048	5,681	5,681	0	252	0	252
2061	35,995	5,314	5,314	0	220	0	220
2062	33,102	4,960	4,960	0	191	0	191
2063	30,365	4,620	4,620	0	166	0	166
2064	27,782	4,293	4,293	0	144	0	144
2065	25,350	3,981	3,981	0	125	0	125

# Appendix E: GASB 67 Fiduciary Net Position Projection

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

Calendar 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 2.71%	Using Single Discount Rate of 7.25%
2066	\$ 23,065	\$ 3,684	\$ 3,684	\$ 0	\$ 107	\$ 0	\$ 107
2067	20,922	3,401	3,401	0	93	0	93
2068	18,917	3,132	3,132	0	79	0	79
2069	17,045	2,878	2,878	0	68	0	68
2070	15,301	2,637	2,637	0	58	0	58
2071	13,679	2,409	2,409	0	50	0	50
2072	12,176	2,194	2,194	0	42	0	42
2073	10,787	1,991	1,991	0	36	0	36
2074	9,506	1,801	1,801	0	30	0	30
2075	8,331	1,621	1,621	0	25	0	25
2076	7,256	1,452	1,452	0	21	0	21
2077	6,278	1,294	1,294	0	17	0	17
2078	5,392	1,147	1,147	0	14	0	14
2079	4,596	1,009	1,009	0	12	0	12
2080	3,884	882	882	0	10	0	10
2081	3,252	764	764	0	8	0	8
2082	2,696	657	657	0	6	0	6
2083	2,212	559	559	0	5	0	5
2084	1,794	470	470	0	4	0	4
2085	1,437	392	392	0	3	0	3
2086	1,135	322	322	0	2	0	2
2087	884	261	261	0	2	0	2
2088	678	208	208	0	1	0	1
2089	511	164	164	0	1	0	1
2090	379	126	126	0	1	0	1
2091	275	96	96	0	0	0	0
2092	196	71	71	0	0	0	0
2093	137	52	52	0	0	0	0
2094	93	37	37	0	0	0	0
2095	62	25	25	0	0	0	0
2096	41	17	17	0	0	0	0
2097	26	11	11	0	0	0	0
2098	16	7	7	0	0	0	0
2099	10	4	4	0	0	0	0
2100	6	3	3	0	0	0	0
2101	4	2	2	0	0	0	0
2102	3	1	1	0	0	0	0
2103	2	0	0	0	0	0	0
2104	1	0	0	0	0	0	0
2105	1	0	0	0	0	0	0
2106	1	0	0	0	0	0	0
2107	1	0	0	0	0	0	0
2108	1	0	0	0	0	0	0
2109	2	0	0	0	0	0	0
2110	2	0	0	0	0	0	0
2111	2	0	0	0	0	0	0
2112	2	0	0	0	0	0	0
2113	2	0	0	0	0	0	0
2114	2	0	0	0	0	0	0
2115	2	0	0	0	0	0	0

## Appendix F: Detailed Tabulations of Member Data

**Table F-1: The Number of Active Members Distributed by Age and Service as of December 31, 2015**

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	10	0	0	0	0	0	0	0	10
25 to 29	0	0	976	208	1	0	0	0	0	0	1,185
30 to 34	0	0	387	796	131	0	0	0	0	0	1,314
35 to 39	0	0	143	314	510	63	0	0	0	0	1,030
40 to 44	0	0	55	118	248	315	55	0	0	0	791
45 to 49	0	0	38	97	177	206	266	32	0	0	816
50 to 54	0	0	8	29	79	79	100	132	13	0	440
55 to 59	0	0	0	1	15	29	30	49	33	0	157
60 to 64	0	0	0	0	5	2	1	1	2	2	13
65 to 69	0	0	0	0	0	0	0	0	0	0	0
70 & Up	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1,617	1,563	1,166	694	452	214	48	2	5,756

## Appendix F: Detailed Tabulations of Member Data

**Table F-2: The Number of Active Members Distributed by Age as of December 31, 2015**

Age	Number
24	10
25	97
26	212
27	268
28	329
29	279
30	243
31	261
32	272
33	282
34	256
35	235
36	220
37	205
38	196
39	174
40	158
41	158
42	167
43	145
44	163
45	197
46	191
47	158
48	137
49	133
50	119
51	109
52	82
53	67
54	63
55	53
56	32
57	26
58	28
59	18
60	6
61	3
63	2
64	2
Total	5,756

## Appendix F: Detailed Tabulations of Member Data

**Table F-3: The Number of Active Members Distributed by Service as of December 31, 2015**

Service	Number
7	579
8	550
9	488
10	346
11	288
12	281
13	316
14	332
15	278
16	249
17	221
18	225
19	193
20	177
21	148
22	139
23	119
24	111
25	100
26	104
27	86
28	87
29	75
30	51
31	58
32	45
33	36
34	24
35	23
36	12
37	5
38	3
39	5
40	1
42	1
Total	5,756

## Appendix F: Detailed Tabulations of Member Data

**Table F-4: The Number and Deferred Annual Retirement Allowances of Terminated Vested Members Distributed by Age as of December 31, 2015**

Age	Number	Allowances
24	1	\$ 2,520
25	4	10,080
26	3	7,560
27	3	7,560
28	6	15,120
29	4	10,080
30	5	12,600
31	7	17,640
32	2	5,040
33	2	3,780
34	1	2,520
35	4	10,080
36	1	2,520
37	2	3,780
38	5	7,938
39	7	9,072
40	24	33,264
41	42	58,716
42	51	71,442
43	66	99,414
44	104	158,382
45	125	190,512
46	145	224,532
47	166	267,246
48	187	312,858
49	202	337,302
50	219	364,518
51	276	476,532
52	292	495,306
53	316	561,078
54	302	534,744
55	292	515,970
56	307	538,776
57	249	433,818
58	239	415,548

## Appendix F: Detailed Tabulations of Member Data

**Table F-4: The Number and Deferred Annual Retirement Allowances of Terminated Vested Members Distributed by Age as of December 31, 2015 (continued)**

Age	Number	Allowances
59	251	\$ 443,016
60	172	316,134
61	97	166,194
62	87	147,672
63	64	100,548
64	79	128,142
65	72	130,410
66	112	193,788
67	113	191,394
68	111	184,212
69	106	182,322
70	78	134,064
71	86	149,184
72	53	92,736
73	63	112,518
74	45	77,112
75	40	72,576
76	30	55,440
77	25	44,730
78	17	28,098
79	26	48,510
80	20	41,958
81	18	34,146
82	8	16,632
83	17	35,028
84	19	40,698
85	18	36,666
86	17	31,878
87	4	10,080
88	2	3,654
89	1	2,520
Total	5,512	\$ 9,469,908

## Appendix F: Detailed Tabulations of Member Data

**Table F-5: The Number and Annual Retirement Allowances of Retired Members Distributed by Age as of December 31, 2015**

Age	Number	Allowances
60	62	\$ 117,925
61	160	292,694
62	164	299,861
63	215	385,960
64	269	486,514
65	289	521,845
66	295	537,931
67	335	604,044
68	335	603,995
69	332	591,444
70	226	423,612
71	213	391,482
72	202	378,000
73	173	331,758
74	127	227,682
75	90	171,108
76	99	199,710
77	121	239,148
78	103	205,632
79	95	190,638
80	80	165,312
81	82	174,006
82	69	148,554
83	64	125,118
84	53	106,722
85	59	125,370
86	49	92,736
87	46	92,232
88	23	49,518
89	15	36,288
90	10	23,562
91	5	9,072
92	5	11,466
93	3	6,300
94	6	10,962
95	5	10,836
96	1	1,260
97	1	2,520
98	2	4,788
100	1	1,260
Total	4,484	\$ 8,398,865