

Legislative Retirement System of North Carolina

Statement of the Results of the Experience
Investigation and Recommended Revised
Tables for Adoption by the Board of Trustees
Prepared as of December 31, 2014





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Board of Trustees
Teachers' and State Employees'
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Members of the Board:

An investigation of the mortality, service and compensation experience of members and beneficiaries of the Legislative Retirement System of North Carolina (the "Retirement System") has been made. This investigation covers the three-year period from January 1, 2012 to December 31, 2014. As a result of the investigation, it is recommended that revised tables be adopted by the Board for future use.

Experience for Active Members

The number of members expected to separate from active service was obtained using the rates currently used for the valuations and the members exposed to the rates. The expected separations were then compared with the actual separations. Based on the comparison of actual separations to expected separations and taking into account reasonable expectations of the future, proposed assumption changes have been made. The non-inflationary, nonproductively component of the salary scale was developed by analyzing actual versus expected merit increases during the three-year period.

The results of the investigation indicate that, in our view, the assumed salary increases and the rates of separation from active service due to mortality, retirement, and termination do not accurately reflect the actual and anticipated experience of the Retirement System. As a result of the investigation, new active service tables have been developed that more closely reflect the actual experience of the membership.

Experience for Retired Members and Survivors of Deceased Members

An investigation of the experience for retired members and survivors of deceased members was prepared separately by gender and cause of retirement. The expected deaths were determined by applying the assumed rates of mortality used for valuation purposes to the number of members in each retirement category. A comparison was then made between the expected and actual deaths in each retirement category.

The results of the investigation indicate that the assumed rates of mortality do not accurately reflect the actual and expected experience of the Retirement System. As a result of the investigation, we are recommending new mortality tables.

Summary

This report contains tables showing a comparison of the actual and expected cases of separation from active service, salary increases due to merit and actual and expected number of deaths among retired members and survivors of deceased members. A comparison between the rates presently in use and the recommended revised rates are also shown in this report. Additionally, this report contains a recommended change in administrative expenses. The table of contents outlines the material contained in this report.

The recommended rates of separation from active service, rates of salary increase and other demographic assumptions are shown in the attached tables in Schedule A of this report. In the actuary's judgment, the rates recommended are suitable for use until further experience indicates that modifications are desirable.

We have also included, in Schedule A, the economic assumptions and funding methods related to the December 31, 2014 valuation of the Retirement System, but such economic assumptions and funding methods are not part of the scope of this experience investigation report.

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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Section 1: Post-Retirement Mortality

The Retirement System currently uses mortality tables that vary by age, gender and health status (i.e., disabled and healthy). The current mortality rates are based on published tables and based on studies that cover significant portions of the U.S. population. The healthy mortality rates also contain a provision to reflect future mortality improvements. The following table shows that, in total, the current mortality tables result in expected mortality rates significantly higher than the actual mortality rates. In addition, recent studies of the U.S. population have determined that the rates of mortality improvement in the U.S. have differed from those predicted by the projection scale currently in use (Scale AA). Further, the current mortality tables do not provide for mortality improvements for members disabled at retirement.

Therefore, we are recommending that the Board adopt a set of mortality tables that better reflect the experience of the Retirement System. The recommended mortality tables are also based on recent studies that cover significant portions of the U.S. population, allow for future mortality improvements based on recent studies (Scale MP-2014) and apply mortality improvement to all members, including those disabled at retirement. Scale MP-2014 includes a two-dimensional improvement assumption that is a function of both age and calendar year. The recommended mortality tables continue to vary by age, gender, and health status (i.e., disabled and healthy).

Post-Retirement Mortality						
Male						
Age	Exposed	Actual	Expected	Actual to Expected Ratio	Proposed	Actual to Proposed Ratio
Total	567	25	43	58%	30	83%
Female						
Age	Exposed	Actual	Expected	Actual to Expected Ratio	Proposed	Actual to Proposed Ratio
Total	122	3	8	38%	4	75%

Section 2: Active Mortality

The Retirement System currently uses mortality tables that vary by age and gender. The current mortality rates are based on published tables and based on recent studies that cover significant portions of the U.S. population. The mortality rates also contain a provision to reflect future mortality improvements.

Therefore, we are recommending that the Board adopt a set of mortality tables consistent with the mortality experience of retirees. The recommended mortality tables are the corresponding active employee table to the post-retirement rates recommended. The recommended mortality tables continue to vary by age and gender.

Section 3: Rates of Retirement

The Retirement System currently uses retirement rates that vary by age. The following table shows that, in total, the retirement rates result in expected retirements less than actual retirements.

Therefore, we are recommending that the Board adopt a set of retirement rates that better reflect the experience of the Retirement System and the expectations for future retirements.

Unreduced Retirement						
Age	Exposed	Actual	Expected	Actual to Expected Ratio	Proposed	Actual to Proposed Ratio
60 to 64	43	4	0	N/A	4	100%
65 to 69	61	12	61	20%	11	109%
>=70	68	13	68	19%	35	37%
Total	172	29	129	22%	50	58%

Section 4: Termination Rates

Termination rates measure the probability that a member will leave prior to retirement eligibility. The Retirement System currently uses no termination rates. Actual termination rates over the past three years have been high enough to warrant the need for a termination decrement.

Therefore, we are recommending that the Board adopt a set of termination rates that better reflect the experience of the Retirement System and the expectations for future terminations.

Termination - First 4 Years						
Total	<u>Exposed</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual to Expected Ratio</u>	<u>Proposed</u>	<u>Actual to Proposed Ratio</u>
Total	246	22	0	N/A	12	183%
Termination - After 4 Years						
Total	<u>Exposed</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual to Expected Ratio</u>	<u>Proposed</u>	<u>Actual to Proposed Ratio</u>
Total	91	12	0	N/A	5	240%

Section 5: Disability Rates

Disability rates measure the probability that a member will become disabled and receive a disability retirement benefit. The Retirement System currently uses disability rates that vary by age. As the disability retirement benefit has little impact on the liability for active members, we are recommending no change in the disability rates.

Section 6: Individual Salary Increase Rates

Individual salary increase rates reflect the increases in a member's salary that are not related to across-the-board type increases (i.e., inflation and productivity). The salary increase rates include elements of salary increase due to promotions and longevity (collectively referred to as "merit increases"). The analysis for these rates is based on analyzing actual versus expected merit increases (i.e., removing the effects of inflation and productivity) for the three-year period of this investigation. Using this comparison, all salaries reflect recent experience such that prior inflation and productivity increases are consistent and can be ignored. We are recommending that the Board adopt a set of salary increase rates that reflect the experience of the Retirement System and the expectations for future increases.

<u>Service</u>	<u>Average Prior Year Salaries</u>	<u>Average Actual Merit-Only Salaries</u>	<u>Actual Underlying Merit Increase</u>	<u>Average Expected Merit-Only Salaries</u>	<u>Expected Merit Increase</u>	<u>Actual to Expected Ratio</u>	<u>Average Proposed Merit-Only Salaries</u>	<u>Proposed Merit Increase</u>	<u>Actual to Proposed Ratio</u>
1 to 5	21,156	20,989	-0.79%	22,003	4.00%	95.4%	21,579	2.00%	97.3%
6 to 10	21,543	21,450	-0.43%	22,404	4.00%	95.7%	21,974	2.00%	97.6%
11 to 15	22,936	22,949	0.06%	23,853	4.00%	96.2%	23,395	2.00%	98.1%
16 to 20	20,939	20,643	-1.41%	21,776	4.00%	94.8%	21,357	2.00%	96.7%
21 to 25	20,659	20,403	-1.24%	21,485	4.00%	95.0%	21,072	2.00%	96.8%
26 to 30	23,186	22,562	-2.69%	24,114	4.00%	93.6%	23,650	2.00%	95.4%
31+	20,659	20,403	-1.24%	21,485	4.00%	95.0%	21,072	2.00%	96.8%

Section 7: Other Assumptions

The Retirement System currently has no provision for assumed administrative expenses. We are recommending adding a provision for assumed administrative expenses equal to 1.00% of payroll.

Section 8: Summary and Cost of Changes

As a result of the experience investigation, we are recommending revised rates of mortality, retirement, termination and salary increase for active members, and revised rates of mortality for retired members and survivors of deceased members.

Based on the results of the December 31, 2014 valuation, and these proposed demographic assumptions, the accrued liability of the System will increase from \$24,067,461 to \$28,590,933 and the required contribution will increase from 0.46% of payroll to 16.77% of payroll. However, it is our understanding that such assumptions, if adopted, would be applied to the December 31, 2015 valuation.

Note: The cost impacts listed above only apply to demographic-type assumptions. Economic assumptions including investment return, real rate of return, general and wage inflation and real wage growth are not included in this report. Additionally, funding methods such as asset valuation method, actuarial cost method and amortization method are not included in this report.

Appendix A: Statement of Actuarial Assumptions and Methods

INTEREST RATE: 7.25% per annum.

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

REAL WAGE GROWTH: 0.50% per annum.

SEPARATIONS BEFORE RETIREMENT: Representative values of the assumed annual rates of separation due to disability are as follows:

<u>Annual Rate of</u>	
<u>Age</u>	<u>Disability*</u>
25	.0001
30	.0004
35	.0010
40	.0029
45	.0049
50	.0084
55	.0144

ADMINISTRATIVE EXPENSES: 1.00% of payroll.

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.

TIMING OF ASSUMPTIONS: All withdrawals, deaths, disabilities, retirements and salary increases are assumed to occur July 1 of each year.

DEATHS AFTER RETIREMENT (NON-DISABLED): According to the RP-2014 Mortality tables for retirees. The active employee rates of RP-2014 are used for ages less than 50.

DEATH AFTER DISABILITY: RP-2014 Mortality tables for disabled annuitants.

DEATHS PRIOR TO RETIREMENT: According to the RP-2014 Mortality tables for active employees.

MORTALITY PROJECTION (NON-DISABLED): All mortality rates are projected from 2014 using Scale MP-2014.

Appendix A: Statement of Actuarial Assumptions and Methods

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.

Appendix A: Statement of Actuarial Assumptions and Methods

LRS Retirement Rates

Age	Service									
	<u><=4</u>	<u>5 to 15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20 to 27</u>	<u>28</u>	<u>29</u>	<u>>=30</u>
<=59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
60	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
61	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
62	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
63	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
64	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
65	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
66	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
67	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
68	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
69	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
70	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
71	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
72	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
73	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
74	0.000	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Appendix A: Statement of Actuarial Assumptions and Methods

LRS Termination Rates

Age	Service					
	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>≥=5</u>
<=24	0.050	0.0500	0.0500	0.0500	0.0500	0.0500
25 to 29	0.050	0.0500	0.0500	0.0500	0.0500	0.0500
30 to 34	0.050	0.0500	0.0500	0.0500	0.0500	0.0500
35 to 39	0.050	0.0500	0.0500	0.0500	0.0500	0.0500
40 to 44	0.050	0.0500	0.0500	0.0500	0.0500	0.0500
45 to 49	0.050	0.0500	0.0500	0.0500	0.0500	0.0500
>=50	0.050	0.0500	0.0500	0.0500	0.0500	0.0500

Appendix A: Statement of Actuarial Assumptions and Methods

LRS Salary Merit Scales

<u>Service</u>	<u>Rate</u>
0	0.0200
1	0.0200
2	0.0200
3	0.0200
4	0.0200
5	0.0200
6	0.0200
7	0.0200
8	0.0200
9	0.0200
10	0.0200
11	0.0200
12	0.0200
13	0.0200
14	0.0200
15	0.0200
16	0.0200
17	0.0200
18	0.0200
19	0.0200
20	0.0200
21	0.0200
22	0.0200
23	0.0200
24	0.0200
>= 25	0.0200