buckconsultants

xerox

The Judicial Retirement System of New Jersey

Report on an Investigation of Experience

Prepared as of June 30, 2014

Document Version: R:\TOBIN\2015\September\NJ09222015AS_JRS2014ExpStudy.docx

Aaron Shapiro
Principal, Consulting Actuary
aaron.shapiro@xerox.com

Buck Consultants, LLC.
500 Plaza Drive
Secaucus, NJ 07096-1533

Tel 201.902.2300
Fax 201.553.6402

September 22, 2015

State House Commission
The Judicial Retirement System
of New Jersey
Trenton, New Jersey 08625-0295

Members of the Commission:

This year an actuarial investigation of the mortality and service experience of the members and beneficiaries of the retirement system was made in accordance with the provisions of Section 31 of Chapter 140, P.L. 1973. This Section specifies that such an investigation shall be made once in every three-year period. The results of this investigation, which examined the experience of the System from July 1, 2011 to June 30, 2014 are described in the attached report.

Buck performed the experience review based on data supplied by the State of New Jersey Division of Pensions and Benefits. Buck Consultants did not audit the data, although it was reviewed for reasonableness and consistency with prior data. The accuracy of the results of this review are dependent on the accuracy of the data.

The assumptions recommended in this report are proposed for use in valuing the pension benefits for members in the Judicial Retirement System. Use of these assumptions for any other purpose may not be appropriate. No one may make any representations or guarantees based on any statements or conclusions contained in this report without the written consent of Buck Consultants.

To the best of our knowledge, this experience investigation report is complete and accurate. 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. An analysis of the potential range of future results is beyond the scope of this valuation.

This report was prepared under my supervision. I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Academy's qualification Standards to issue this Statement of Actuarial Opinion. This report has been prepared in accordance with all applicable Actuarial Standards of Practice and I am available to answer questions about it.

We are available at the Commission's convenience to discuss this report.

Respectfully submitted,

Aaron Shapiro

Aaron Shapiro, FSA, EA, MAAA
Principal, Consulting Actuary

Table of Contents

Report on an Investigation of the Experience of The Judicial Retirement System of New Jersey

Prepared as of June 30, 2014

I. Introduction

Section 31 of Chapter 140, P.L. 1973 of the New Jersey Statutes provides that once in every three-year period the actuary shall examine in detail the mortality and service experience of the members and beneficiaries of the Retirement System. This investigation is designed to ensure that the tables used for determining expected liabilities of the Retirement System are consistent with recent experience. If tables are not updated periodically, the liabilities of the System may be overstated or understated, and resulting contributions either too large or too small to fund the actual accruing liabilities.

This report was prepared in accordance with applicable Actuarial Standards of Practice (ASOP). The Standards of Practice provide guidance to actuaries in selecting various actuarial assumptions for measuring obligations under defined benefit plans.

This report summarizes the Retirement System's experience for the period from July 1, 2011 to June 30, 2014. Experience for active male and female members and disabled members were combined for the study. Mortality experience among service retired members and beneficiaries were based on gender. In instances where the data being examined appeared inconsistent with prior results or incomplete, we made no recommendation. These items will be reviewed closely when the next scheduled experience study is prepared as of June 30, 2017 and proposed changes, if warranted, will be recommended at that time.

II. Examination of Experience

As noted earlier, the examination covers the three-year period from July 1, 2011 to June 30, 2014. Where appropriate, we have made reference to trends that were first identified in prior studies.

The experience among active members, retired members and beneficiaries has been compared with the experience expected according to the active service tables and retirement tables adopted by the State House Commission as a result of the July 1, 2008 - June 30, 2011 experience study.

In the case of withdrawals, the current assumption is that no termination will occur prior to retirement. The information presented shows the actual number of vested and non-vested terminations. In investigating the experience with respect to death, male and female members were examined separately. With regard to disability and retirement, members were treated in one group.

The expected number of separations from service on account of withdrawal, death, disability and service retirement was calculated by multiplying the rates of separation used as a basis for the active service tables by the number of those exposed to risk. Similarly, the expected number of deaths among service retirees, beneficiaries of deceased members and disability retirees was calculated by multiplying the rate of mortality used as a basis for the inactive tables by the number exposed to risk. The actual number was then compared with the expected number. The tables shown in Section III present the results of these comparisons. If the ratio of actual to expected is 1.000, the tables have exactly predicted what actually occurred. If the ratio of actual to expected is greater than 1.000, then the tables have underestimated actual experience. If the ratio is less than 1.000, then the tables have overstated actual experience.

Finally, the expected salaries of those members who remain in service from year to year were obtained and these expected salaries were compared with the actual salaries. Again, a ratio of actual to expected of 1.000 would indicate that actual salary increases were identical to anticipated increases while a ratio greater than 1.000 indicates that salaries have increased faster than anticipated and a ratio less than 1.000 indicates that salaries have increased slower than anticipated.

III. Comments and General Recommendation of the Actuary

The following presents the tabular results of the experience data studied, a discussion of the results and our recommendation.

The tables present a summary of the number of exposures, actual and expected experience and the ratios of actual to expected experience. In addition, we have prepared graphs that illustrate the actual current and proposed (if applicable) rates for each assumption. Please note that the experience for certain assumptions, such as accidental death that has a large exposed population and a rather small incidence, does not graph well because of the relative number of members.

A. Active Plan Experience

The first portion of this section contains a summary of active plan experience, which examines the following rates:

a. Withdrawal Rates

b. Disability Rates

c. Service Retirement Rates

d. Salary Increase Rates

a. Vested and Non-Vested Withdrawal Rates

The following table presents a summary of the number of exposures, actual and expected terminations and the ratios of actual to expected terminations of Vested and Non-Vested withdrawals.

Central Age of Group	Number of Separations					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
35	0	0	0.00	0.00	0.0000	0.0000
40	14	0	0.00	0.00	0.0000	0.0000
45	57	0	0.00	0.00	0.0000	0.0000
50	148	2	0.00	0.00	0.0000	0.0000
55	214	1	0.00	0.00	0.0000	0.0000
58	47	0	0.00	0.00	0.0000	0.0000
59	50	0	0.00	0.00	0.0000	0.0000
Total	530	3	0.00	0.00	0.0000	0.0000

Recommendation: No change.

The current assumption is that no vested (meeting the vested eligibility requirement of five or more years of judicial service and ten or more years of aggregate public service) or non-vested (prior to meeting the vesting requirement) terminations will occur.

The study shows that there were 3 terminations out of 530 exposures, or approximately 0.6%, during the study period. This is in line with the experience from the prior five studies and supports the current assumption. Therefore, we do not recommend any change to the assumed rates of withdrawal.

b. Disability Rates

The following table presents a summary of the number of exposures, actual and expected terminations and the ratios of actual to expected terminations due to disability.

Central Age of Group	Number of Separations					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
35	0	0	0.00	0.00	0.0000	0.0000
40	14	0	0.00	0.00	0.0000	0.0000
45	57	0	0.03	0.03	0.0000	0.0000
50	152	0	0.18	0.18	0.0000	0.0000
55	257	0	0.49	0.49	0.0000	0.0000
60	378	0	1.24	1.24	0.0000	0.0000
65	291	1	1.35	1.35	0.7407	0.7407
68	32	0	0.19	0.19	0.0000	0.0000
69	27	0	0.18	0.18	0.0000	0.0000
Total	1,208	1	3.66	3.66	0.2732	0.2732

Recommendation: No change.

The experience of disability indicates that incidence of disability is very small. No change is recommended to the assumed rates of disability among active members.

c. Service Retirement Rates

The retirement assumption is that 25% of judges who have 12 or more years of judicial service but have not attained age 60 with 20 years of judicial service or age 65 with 15 years of judicial service will retire at age 65. At age 70, all remaining active members are assumed to retire.

1. Retirements at age 60 with 20 years of judicial service or age 65 with 15 years of judicial service

The following table presents a summary of the number of exposures, actual and expected retirements and the ratios of actual to expected retirements among members at age 60 with 20 years of judicial service or age 65 with 15 years of judicial service.

Central Age of Group	Number of Separations					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
60	8	1	2.40	2.40	0.4167	0.4167
61	16	2	3.20	3.20	0.6250	0.6250
62	23	4	4.60	4.60	0.8696	0.8696
63	23	6	4.60	6.90	1.3043	0.8696
64	15	5	3.00	4.50	1.6667	1.1111
65	18	9	4.50	6.75	2.0000	1.3333
66	10	2	2.00	2.40	1.0000	0.8333
67	11	3	2.20	2.64	1.3636	1.1364
68	15	5	3.00	3.60	1.6667	1.3889
69	16	6	3.20	3.84	1.8750	1.5625
Total	155	43	32.70	40.83	1.3150	1.0531

Recommendation: Increase rates on and after age 63.

The retirement assumption for members who have attained age 60 with 20 years of judicial service is 30% at age 60 and 20% for all other ages. The retirement assumption for members who have attained age 65 with 15 years of judicial service is 25% at age 65 and 20% for all other ages.

The experience for members who are age 60 or over with at least 20 years of judicial service or who are at least age 65 with 15 or more years of judicial service shows that actual retirements for the three-year period were about 132% of that expected (roughly 28% of those eligible actually retired when 21% was expected). In particular, the actual experience for participants who are age 63 and older was more than expected. This is consistent with the prior study and we recommend increasing the retirement rates on and after age 63.

2. Retirements after age 59 with less than 12 years of judicial service

The following table presents a summary of the number of exposures, actual and expected retirements and the ratios of actual to expected retirements among members after age 59 with less than 12 years of judicial service.

Central Age of Group	Number of Separations					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
60	44	1	0.00	1.10	0.0000	1.1364
61	36	0	0.00	0.90	0.0000	0.0000
62	30	3	0.00	0.75	0.0000	5.0000
63	34	1	0.00	0.85	0.0000	1.4706
64	38	0	0.00	0.95	0.0000	0.0000
65	31	1	0.00	0.78	0.0000	1.6129
66	27	0	0.00	0.68	0.0000	0.0000
67	17	1	0.00	0.43	0.0000	2.9412
68	13	1	0.00	0.33	0.0000	3.8462
69	4	0	0.00	0.10	0.0000	0.0000
Total	274	8	0.00	6.87	0.0000	1.4599

Recommendation: Increase rates at all ages.

The experience for members who are at least age 60 and have less than 12 years of judicial service. Although no retirements were expected from this group during the three year study period, 8 judges actually retired. Due to the continued higher than expected retirement incidence, we recommend an increase in these retirement rates.

3. Retirements after age 59 with 12 or more years of judicial service (but have not attained age 60 with 20 years of judicial service or age 65 with 15 years of judicial service)

The following table presents a summary of the number of exposures, actual and expected retirements and the ratios of actual to expected retirements among members after age 59 with 12 or more years of judicial service (but have not attained age 60 with 20 years of judicial service or age 65 with 15 years of judicial service).

Central Age of Group	Number of Separations					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
60	25	1	0.00	0.00	0.0000	0.0000
61	23	0	0.00	0.00	0.0000	0.0000
62	20	0	0.00	0.00	0.0000	0.0000
63	18	0	0.00	0.00	0.0000	0.0000
64	21	0	0.00	0.00	0.0000	0.0000
65	9	0	2.25	0.90	0.0000	0.0000
66	9	0	0.00	0.00	0.0000	0.0000
67	7	0	0.00	0.00	0.0000	0.0000
68	5	0	0.00	0.00	0.0000	0.0000
69	2	0	0.00	0.00	0.0000	0.0000
Total	139	1	2.25	0.90	0.0000	0.0000

Recommendation: Decrease rate at age 65.

Actual retirements for the three-year period indicate that this incidence of retirement is relatively small. However, due to the continued lower than expected retirement incidence, we recommend a decrease in the retirement rate.

4. Early retirement prior to age 60 with 5 years of judicial service and 25 or more years of aggregate public service

The following table presents a summary of the number of exposures, actual and expected retirements and the ratios of actual to expected retirements among members prior to age 60 with 5 years of judicial service and 25 or more years of aggregate public service.

Central Age of Group	Number of Separations					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
<53	4	0	0.00	0.00	0.0000	0.0000
53	1	0	0.00	0.00	0.0000	0.0000
54	2	0	0.00	0.00	0.0000	0.0000
55	6	0	0.00	0.00	0.0000	0.0000
56	12	0	0.00	0.00	0.0000	0.0000
57	19	0	0.00	0.00	0.0000	0.0000
58	22	0	0.00	0.00	0.0000	0.0000
59	21	0	0.00	0.00	0.0000	0.0000
Total	87	0	0.00	0.00	0.0000	0.0000

Recommendation: No change.

The experience for members who meet the Early Retirement eligibility (prior to age 60 while serving as a judge with 5 consecutive years of judicial service and 25 or more years of aggregate public service) shows that there were no actual retirements out of the 87 exposures and none are expected. Therefore we do not recommend any changes in this assumption.

d. Salary Increase Rates

The following table presents a summary of the total salary from the prior year, actual and expected salary for the following year and the ratios of actual to expected salary among continuing actives. The table reflects the Salary experience during the period July 1, 2011 through June 30, 2014.

	Salary Increase			
Central Age of Group	Actual Salary from Previous Year	Actual	Expected	Ratio of Actual to Expected
40	$ 3,341,250	$ 3,708,788	$ 3,424,781	1.083
45	9,522,563	10,629,352	9,760,627	1.089
50	29,999,280	32,125,710	30,749,262	1.045
55	44,318,096	45,884,866	45,426,048	1.010
60	60,216,337	61,381,070	61,721,745	0.994
65	34,876,224	35,361,942	35,748,129	0.989
Greater than 67	2,381,659	2,402,542	2,441,201	0.984
Total	$ 184,655,409	$ 191,494,270	$ 189,271,793	1.012

Recommendation: No change.

The three-year study shows actual salary increases were about 1.2% higher than expected. However, based on historical data we have accumulated for the nine years examined for the previous experience studies, it appears that members of the system do not receive salary increases on an annual basis.

The current salary increase assumption reflects a 2.50% per annum increase through fiscal year ending 2021 and 3.50% per annum increase for fiscal years ending 2022 and thereafter. We believe this is a reasonable assumption given the experience of the System and discussions with the Division of Pension and Benefits regarding anticipated salary growth. Therefore, we recommend no changes to the salary scale at this time.

B. Mortality Experience Among Active and Inactive Plan Members

As noted in prior experience studies, we have seen continued and steady improvement in mortality rates over time. This trend is expected to continue into the future. In fact, Actuarial Standard of Practice No. 35 states that the actuary should "include an assumption as to expected mortality improvement after the measurement date." Accordingly, in our prior experience study we recommended the use of projection scale AA in the projection of the mortality tables to provide a generational approach toward future mortality improvements.

Since the last experience study, the Society of Actuaries (SOA) conducted a mortality study and determined that the overall rates of mortality improvement in the US have differed from those predicted by Scale AA. Based on their study, the SOA published an updated mortality improvement projection scale, MP-2014. However, there are many who believe that the SOA's MP-2014 scale is unduly conservative with unrealistic mortality improvement rates. Emerging experience since the data was collected by the SOA seems to support that contention. Therefore, Buck has published an alternative mortality improvement scale, the Buck Modified MP-2014. The Buck table was constructed to provide a reasonable projection scale for use by employers who believe that future mortality improvement will be lower than that predicted by the SOA's MP-2014. The parameters used in the construction of this table were based on the mortality improvement forecasts from the Social Security Administration just as they were used by the SOA in developing MP-2014. The substantive difference between the Buck scale and that published by the SOA's MP-2014 scale is that the Buck scale applies a 15 year period prior to reaching an ultimate improvement rate of 0.75% versus the SOA's scale which applies a 20 year period prior to reaching an ultimate improvement rate of 1.0%. This scale is based on the SOA's Retirement Plans Experience Committee 2014 model, which is the same methodology used for the development of the MP-2014 projection scale. The 0.75% ultimate level is reduced after age 85 to 0.60% at age 95, then to 0.0% by age 115. We recommend the use of the Buck Modified MP-2014 in the projection of the mortality tables.

The mortality experience for all retirees, beneficiaries and active participants eligible for ordinary death benefits is not sufficient to be considered statistically credible. Therefore, we have recommended the use of the RP-2000 Combined Healthy Mortality Tables unadjusted for males and ages set forward 3 years for females projected on a generational basis from the base year of 2000 to 2013 using Projection Scale BB as the base tables. Projection Scale BB is an alternative projection scale developed by the SOA that is based on more recent data and newly developed techniques. Scale BB is very similar in its projection of future mortality improvements to the Buck Modified MP-2014. The base tables , projected to 2013 with Scale BB, will be further projected beyond the valuation date using the Buck Modified MP-2014.

a. Death Rates among Active Members

The following tables present a summary of the number of exposures, actual and expected terminations and the ratios of actual to expected terminations among male and female active members.

1. Male Death Rates

Central Age of Group	Number of Male Deaths					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
20	0	0	0.00	0.00	0.0000	0.0000
25	0	0	0.00	0.00	0.0000	0.0000
30	0	0	0.00	0.00	0.0000	0.0000
35	0	0	0.00	0.00	0.0000	0.0000
40	6	0	0.00	0.01	0.0000	0.0000
45	38	0	0.04	0.06	0.0000	0.0000
50	83	0	0.13	0.19	0.0000	0.0000
55	170	0	0.37	0.61	0.0000	0.0000
60	265	1	1.01	1.69	0.9901	0.5917
65	236	1	1.56	2.54	0.6410	0.3937
68	28	0	0.28	0.42	0.0000	0.0000
69	24	0	0.27	0.40	0.0000	0.0000
Total	850	2	3.66	5.92	0.5464	0.3378

2. Female Death Rates

Central Age of Group	Number of Female Deaths					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
20	0	0	0.00	0.00	0.0000	0.0000
25	0	0	0.00	0.00	0.0000	0.0000
30	0	0	0.00	0.00	0.0000	0.0000
35	0	0	0.00	0.00	0.0000	0.0000
40	8	0	0.00	0.00	0.0000	0.0000
45	19	0	0.02	0.01	0.0000	0.0000
50	69	0	0.10	0.08	0.0000	0.0000
55	87	0	0.19	0.15	0.0000	0.0000
60	113	0	0.38	0.28	0.0000	0.0000
65	55	0	0.34	0.20	0.0000	0.0000
68	4	0	0.04	0.02	0.0000	0.0000
69	3	0	0.03	0.02	0.0000	0.0000
Total	358	0	1.10	0.76	0.0000	0.0000

Recommendation: The experience for active deaths indicates that there were 2 actual male deaths during the measurement period compared to 3.66 expected male deaths and no actual female deaths compared to 1.10 expected female deaths. Since the incidence of actual deaths is not sufficient to be considered statistically credible, we recommend using the RP-2000 Combined Healthy Mortality Tables unadjusted for males and ages set forward 3 years for females projected on a generational basis from the base year of 2000 to 2013 using Projection Scale BB as the base tables. The base tables will be projected beyond the valuation date using the Buck Modified MP-2014.

b. Inactive Plan Experience

The second portion of this section contains a summary of inactive plan experience which examines the following rates:

1. Service Retirement and Beneficiaries Mortality Rates
2. Disability Mortality Rates

1. Service Retirement and Beneficiaries Mortality Rates

The experience indicates that the number of actual deaths were about 37% higher than expected for male retirees and beneficiaries and 49% higher than expected for female retirees and beneficiaries.

Central Age of Group	Number of Male Deaths					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
<48	3	0	0.00	0.00	0.0000	0.0000
50	0	0	0.00	0.00	0.0000	0.0000
55	2	0	0.00	0.00	0.0000	0.0000
60	9	0	0.40	0.06	0.0000	0.0000
65	121	0	0.90	1.44	0.0000	0.0000
70	256	5	3.38	4.87	1.4793	1.0267
75	245	7	5.50	7.84	1.2727	0.8929
80	186	10	7.01	10.00	1.4265	1.0000
85	113	7	7.29	10.45	0.9602	0.6699
90	76	17	9.38	12.27	1.8124	1.3855
Total	1,011	46	33.50	46.93	1.3731	0.9802

Central Age of Group	Number of Female Deaths					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
<48	0	0	0.00	0.00	0.0000	0.0000
50	4	0	0.01	0.01	0.0000	0.0000
55	0	0	0.00	0.00	0.0000	0.0000
60	17	0	0.07	0.14	0.0000	0.0000
65	70	2	0.48	0.83	4.1667	2.4096
70	81	2	0.98	1.60	2.0408	1.2500
75	88	5	1.87	2.94	2.6738	1.7007
80	94	5	3.23	5.15	1.5480	0.9709
85	89	7	5.10	8.37	1.3725	0.8363
90	117	17	13.83	17.61	1.2292	0.9654
Total	560	38	25.57	36.65	1.4861	1.0368

Recommendation: Since the incidence of actual deaths is not sufficient to be considered statistically credible, we recommend using the RP-2000 Combined Healthy Mortality Tables unadjusted for males and ages set forward 3 years for females projected on a generational basis from the base year of 2000 to 2013 using Projection Scale BB as the base tables. The base tables will be projected beyond the valuation date using the Buck Modified MP-2014.

2. Disability Mortality Rates

The results indicate that there were three actual deaths among the relatively small population of male disabled retirees. Actual deaths among female disabled retirees were within a reasonable range of that expected.

Central Age of Group	Number of Male Deaths					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
<48	0	0	0.00	0.00	0.0000	0.0000
50	0	0	0.00	0.00	0.0000	0.0000
55	0	0	0.00	0.00	0.0000	0.0000
60	2	0	0.09	0.09	0.0000	0.0000
65	9	2	0.49	0.49	4.0816	4.0816
70	4	0	0.26	0.26	0.0000	0.0000
75	0	0	0.00	0.00	0.0000	0.0000
80	2	1	0.25	0.25	4.0000	4.0000
85	0	0	0.00	0.00	0.0000	0.0000
90	2	0	0.75	0.75	0.0000	0.0000
Total	19	3	1.84	1.84	1.6304	1.6304

Central Age of Group	Number of Female Deaths					
	Exposures	Actual	Expected		Ratio of Actual to Expected	
			Current	Proposed	Current	Proposed
<48	0	0	0.00	0.00	0.0000	0.0000
50	0	0	0.00	0.00	0.0000	0.0000
55	3	0	0.06	0.06	0.0000	0.0000
60	0	0	0.00	0.00	0.0000	0.0000
65	3	0	0.09	0.09	0.0000	0.0000
70	0	0	0.00	0.00	0.0000	0.0000
75	0	0	0.00	0.00	0.0000	0.0000
80	0	0	0.00	0.00	0.0000	0.0000
85	0	0	0.00	0.00	0.0000	0.0000
90	0	0	0.00	0.00	0.0000	0.0000
Total	6	0	0.15	0.15	0.0000	0.0000

Recommendation: No change from the current mortality tables; The RP-2000 Disability Mortality Tables set forward 2 years for males and females.

IV. Summary of Proposed Assumptions

As noted earlier in the report, the experience investigation for the period from July 1, 2011 to June 30, 2014 indicates the need for certain changes in the tables used for determining the liabilities of the System. The proposed changes are summarized as follows:

Rates	Proposed Changes
Non-Vested Withdrawal	No Change
Disability	No Change
Retirement	
Age 60 with 20 years of judicial service or age 65 with 15 years of judicial service	Adjust[1]
Age 60 with less than 12 years of judicial service	Increase
Age 60 with 12 or more years of judicial service (but not meeting the 60/20 or 65/15 eligibility)	Decrease
Less than age 60 with 5 years of judicial service and 25 or more years of public service	No Change
Salary Increase	No Change
Active Death	Change[2]
Inactive Mortality	
Retired male and female members and beneficiaries	Change[2]
Disability Retirements	No Change

1. Increase rates on and after age 63.
2. In addition, the base tables will be projected beyond the valuation date using the Buck Modified MP-2014.

V. Cost Impact of the Proposed Assumptions

The overall effect of the proposed changes in assumptions would be to decrease the normal contribution and the accrued liability payment. The following chart presents a summary of the liabilities and contributions under the current and proposed assumptions:

	Current	Proposed
Actuarial Accrued Liability	$ 632,679,937	$ 588,049,103
Additional Accrued Liability		
Unfunded Accrued Liability/(Surplus)	$ 374,578,440	$ 329,947,606
Funded Ratios		
Actuarial Value of Assets	40.8%	43.9%
Market Value of Assets	38.7%	41.6%
Required Contribution		
Normal Cost	$ 13,543,400	$ 13,032,018
Accrued Liability	32,959,419	29,032,321
Total Contribution	$ 46,502,819	$ 42,064,339
Additional Annual Contribution		$ (4,438,480)

The calculations were based on the same data and actuarial methods as were used in the July 1, 2014 valuation. In addition, the comparison of contribution amounts presented is based on the full recommended contribution amounts.

Appendix A. Comparison of Actual, Current and Proposed Rates of Separation and Mortality

The following tables give a comparison of the actual, current and proposed rates of separation from active service and rates of mortality for active and retired members at quinquennial ages.

Table 1

Comparison of Actual and Expected Rates of Separation from Active Service

Vested and Non-Vested Withdrawals

Central Age of Group	Actual Rates	Current Rates	Proposed Rates: No Change
35	0.00000	0.00000	0.00000
40	0.00000	0.00000	0.00000
45	0.00000	0.00000	0.00000
50	0.01351	0.00000	0.00000
55	0.00467	0.00000	0.00000
60	0.00000	0.00000	0.00000
65	0.00000	0.00000	0.00000
68	0.00000	0.00000	0.00000
69	0.00000	0.00000	0.00000

Table 2

Comparison of Actual and Expected Rates of Separation from Active Service

Disability Retirements

Central Age of Group	Actual Rates	Current Rates	Proposed Rates: No Change
35	0.00000	0.00026	0.00026
40	0.00000	0.00034	0.00034
45	0.00000	0.00063	0.00063
50	0.00000	0.00115	0.00115
55	0.00000	0.00193	0.00193
60	0.00000	0.00326	0.00326
65	0.00344	0.00477	0.00477
68	0.00000	0.00599	0.00599
69	0.00000	0.00652	0.00652

Table 3

Comparison of Actual and Expected Rates of Separation from Active Service

Retirements

Type	Central Age of Group	Actual Rates	Current Rates	Proposed Rates
Age 60 with 20 years of judicial service or age 65 with 15 years of judicial service[1]	**60**	0.12500	0.30000	0.30000
	61	0.12500	0.20000	0.20000
	62	0.17391	0.20000	0.20000
	63	0.26087	0.20000	0.30000
	64	0.33333	0.20000	0.30000
	65	0.50000	0.25000	0.37500
	66	0.20000	0.20000	0.24000
	67	0.27273	0.20000	0.24000
	68	0.33333	0.20000	0.24000
	69	1.37500	0.20000	0.24000
After age 59 with less than 12 years of judicial service[2]	**60**	0.02773	0.00000	0.02500
	61	0.00000	0.00000	0.02500
	62	0.10000	0.00000	0.02500
	63	0.02941	0.00000	0.02500
	64	0.00000	0.00000	0.02500
	65	0.03225	0.00000	0.02500
	66	0.00000	0.00000	0.02500
	67	0.05882	0.00000	0.02500
	68	0.07692	0.00000	0.02500
	69	0.00000	0.00000	0.02500
After age 59 with twelve or more years of judicial service (but have not attained age 60 with 20 years of judicial service or age 65 with 15 years of judicial service)[3]	**60**	0.04000	0.00000	0.00000
	61	0.00000	0.00000	0.00000
	62	0.00000	0.00000	0.00000
	63	0.00000	0.00000	0.00000
	64	0.00000	0.00000	0.00000
	65	0.00000	0.25000	0.10000
	66	0.00000	0.00000	0.00000
	67	0.00000	0.00000	0.00000
	68	0.00000	0.00000	0.00000
	69	0.00000	0.00000	0.00000
Prior to age 60 with 5 years of judicial service and 25 or more years of aggregate public service	**50**	0.00000	0.00000	0.00000
	51	0.00000	0.00000	0.00000
	52	0.00000	0.00000	0.00000
	53	0.00000	0.00000	0.00000
	54	0.00000	0.00000	0.00000
	55	0.00000	0.00000	0.00000
	56	0.00000	0.00000	0.00000
	57	0.00000	0.00000	0.00000
	58	0.00000	0.00000	0.00000
	59	0.00000	0.00000	0.00000

1. Increase rates on and after age 63 for Age 60 with 20 years of judicial service or age 65 with 15 years of judicial service. No change for the other retirement categories.
2. Due to the continued higher than expected retirement incidence, we recommend an increase in these retirement rates.
3. Due to the continued lower than expected retirement incidence, we recommend an decrease in the age 65 retirement rate.

Table 4

Comparison of Actual and Expected Salary Increases

		Current Rates		Proposed Rates: No Change	
Central Age of Group	Actual Rates	Through Fiscal Year Ending 2021	Fiscal Year Ending 2022 and Thereafter	Through Fiscal Year Ending 2021	Fiscal Year Ending 2022 and Thereafter
40	11.000%	2.500%	3.500%	2.500%	3.500%
45	11.620%	2.500%	3.500%	2.500%	3.500%
50	7.090%	2.500%	3.500%	2.500%	3.500%
55	3.540%	2.500%	3.500%	2.500%	3.500%
60	1.930%	2.500%	3.500%	2.500%	3.500%
65	1.390%	2.500%	3.500%	2.500%	3.500%
Over 67	0.880%	2.500%	3.500%	2.500%	3.500%

Table 5

Comparison of Actual and Expected Rates of Deaths from Active Service

Male

Central Age of Group	Actual Rates	Current Rates	Proposed Rates[1]
20	0.00000	0.00028	0.00034
25	0.00000	0.00034	0.00036
30	0.00000	0.00038	0.00044
35	0.00000	0.00046	0.00074
40	0.00000	0.00077	0.00104
45	0.00000	0.00108	0.00145
50	0.00000	0.00151	0.00214
55	0.00000	0.00222	0.00357
60	0.00377	0.00373	0.00626
65	0.00424	0.00688	0.01100
68	0.00000	0.01001	0.01468
69	0.00000	0.01128	0.01627

Female

Central Age of Group	Actual Rates	Current Rates	Proposed Rates[1]
20	0.00000	0.00019	0.00019
25	0.00000	0.00019	0.00023
30	0.00000	0.00023	0.00038
35	0.00000	0.00035	0.00058
40	0.00000	0.00056	0.00091
45	0.00000	0.00086	0.00139
50	0.00000	0.00133	0.00216
55	0.00000	0.00204	0.00373
60	0.00000	0.00353	0.00673
65	0.00000	0.00676	0.01165
68	0.00000	0.00971	0.01588
69	0.00000	0.01095	0.01766

1. The base table will be projected beyond the valuation date using the Buck Modified MP-2014.

Table 6

Comparison of Actual and Expected Rates of Mortality Among Retired Members and Beneficiaries

Males

Central Age of Group	Actual Rates	Current Rates	Proposed Rates[1]
45	0.00000	0.00108	0.00145
50	0.00000	0.00151	0.00214
55	0.00000	0.00222	0.00357
60	0.00000	0.00373	0.00626
65	0.00000	0.00688	0.01100
70	0.01953	0.01290	0.01836
75	0.02857	0.02235	0.03142
80	0.05376	0.03824	0.05372
85	0.06195	0.06539	0.09217
90	0.22368	0.11182	0.15920

Females

Central Age of Group	Actual Rates	Current Rates	Proposed Rates[1]
45	0.00000	0.00086	0.00139
50	0.00000	0.00133	0.00216
55	0.00000	0.00204	0.00373
60	0.00000	0.00353	0.00673
65	0.02857	0.00676	0.01165
70	0.02469	0.01223	0.01979
75	0.05682	0.02088	0.03249
80	0.05319	0.03446	0.05411
85	0.07865	0.05700	0.09246
90	0.14530	0.09732	0.14786

1. The base table will be projected beyond the valuation date using the Buck Modified MP-2014.

Table 7

Comparison of Actual and Expected Rates of Mortality Among Disabled Members

Males

Central Age of Group	Actual Rates	Current Rates	Proposed Rates: No Change
45	0.00000	0.02513	0.02513
50	0.00000	0.03156	0.03156
55	0.00000	0.03804	0.03804
60	0.00000	0.04508	0.04508
65	0.22222	0.05467	0.05467
70	0.00000	0.06973	0.06973
75	0.00000	0.09244	0.09244
80	0.50000	0.11201	0.11201
85	0.00000	0.15532	0.15532
90	0.00000	0.21683	0.21683

Females

Central Age of Group	Actual Rates	Current Rates	Proposed Rates: No Change
45	0.00000	0.00900	0.00900
50	0.00000	0.01349	0.01349
55	0.00000	0.01865	0.01865
60	0.00000	0.02415	0.02415
65	0.00000	0.03150	0.03150
70	0.00000	0.04306	0.04306
75	0.00000	0.05978	0.05978
80	0.00000	0.08267	0.08267
85	0.00000	0.11505	0.11505
90	0.00000	0.16058	0.16058

Appendix B: Complete Set of Proposed Assumptions

TABLE 1
ACTIVE TERMINATION TABLES

Vested and Non-Vested		
Age	**Withdrawals**	**Disability**
20	0.00000	0.00019
21	0.00000	0.00020
22	0.00000	0.00020
23	0.00000	0.00020
24	0.00000	0.00021
25	0.00000	0.00021
26	0.00000	0.00021
27	0.00000	0.00021
28	0.00000	0.00022
29	0.00000	0.00022
30	0.00000	0.00022
31	0.00000	0.00023
32	0.00000	0.00024
33	0.00000	0.00024
34	0.00000	0.00026
35	0.00000	0.00026
36	0.00000	0.00028
37	0.00000	0.00028
38	0.00000	0.00030
39	0.00000	0.00030
40	0.00000	0.00033
41	0.00000	0.00036
42	0.00000	0.00043
43	0.00000	0.00047
44	0.00000	0.00054
45	0.00000	0.00064
46	0.00000	0.00071
47	0.00000	0.00080
48	0.00000	0.00091
49	0.00000	0.00102
50	0.00000	0.00114
51	0.00000	0.00126
52	0.00000	0.00142
53	0.00000	0.00157
54	0.00000	0.00177
55	0.00000	0.00197
56	0.00000	0.00218
57	0.00000	0.00218
58	0.00000	0.00269
59	0.00000	0.00296
60	0.00000	0.00326
61	0.00000	0.00354
62	0.00000	0.00383
63	0.00000	0.00412
64	0.00000	0.00442
65	0.00000	0.00473
66	0.00000	0.00510
67	0.00000	0.00550
68	0.00000	0.00599
69	0.00000	0.00652

TABLE 2

ACTIVE SERVICE RETIREMENT TABLES

Age	Age 60 with 20 Years Judicial Service or Age 65 with 15 Years Judicial Service	After Age 59 with Less than 12 Years Judicial Service	After Age 59 with 12 or More Years of Judicial Service (but have not attained 60/20JS or 65/15JS)	Prior to age 60 with 5 Years Judicial Service and 25 Years Public Service
50	0.00000	0.00000	0.00000	0.00000
51	0.00000	0.00000	0.00000	0.00000
52	0.00000	0.00000	0.00000	0.00000
53	0.00000	0.00000	0.00000	0.00000
54	0.00000	0.00000	0.00000	0.00000
55	0.00000	0.00000	0.00000	0.00000
56	0.00000	0.00000	0.00000	0.00000
57	0.00000	0.00000	0.00000	0.00000
58	0.00000	0.00000	0.00000	0.00000
59	0.00000	0.00000	0.00000	0.00000
60	0.30000	0.02500	0.00000	0.00000
61	0.20000	0.02500	0.00000	0.00000
62	0.20000	0.02500	0.00000	0.00000
63	0.30000	0.02500	0.00000	0.00000
64	0.30000	0.02500	0.00000	0.00000
65	0.37500	0.02500	0.10000	0.00000
66	0.24000	0.02500	0.00000	0.00000
67	0.24000	0.02500	0.00000	0.00000
68	0.24000	0.02500	0.00000	0.00000
69	0.24000	0.02500	0.00000	0.00000

TABLE 3
SALARY INCREASES

Age	Salary Increase		Age	Salary Increase	
	Through FYE2021	FYE2022 and thereafter		Through FYE2021	FYE2022 and thereafter
20	0.0250	0.0350	**45**	0.0250	0.0350
21	0.0250	0.0350	**46**	0.0250	0.0350
22	0.0250	0.0350	**47**	0.0250	0.0350
23	0.0250	0.0350	**48**	0.0250	0.0350
24	0.0250	0.0350	**49**	0.0250	0.0350
25	0.0250	0.0350	**50**	0.0250	0.0350
26	0.0250	0.0350	**51**	0.0250	0.0350
27	0.0250	0.0350	**52**	0.0250	0.0350
28	0.0250	0.0350	**53**	0.0250	0.0350
29	0.0250	0.0350	**54**	0.0250	0.0350
30	0.0250	0.0350	**55**	0.0250	0.0350
31	0.0250	0.0350	**56**	0.0250	0.0350
32	0.0250	0.0350	**57**	0.0250	0.0350
33	0.0250	0.0350	**58**	0.0250	0.0350
34	0.0250	0.0350	**59**	0.0250	0.0350
35	0.0250	0.0350	**60**	0.0250	0.0350
36	0.0250	0.0350	**61**	0.0250	0.0350
37	0.0250	0.0350	**62**	0.0250	0.0350
38	0.0250	0.0350	**63**	0.0250	0.0350
39	0.0250	0.0350	**64**	0.0250	0.0350
40	0.0250	0.0350	**65**	0.0250	0.0350
41	0.0250	0.0350	**66**	0.0250	0.0350
42	0.0250	0.0350	**67**	0.0250	0.0350
43	0.0250	0.0350	**68**	0.0250	0.0350
44	0.0250	0.0350	**69**	0.0250	0.0350

TABLE 4

ACTIVE DEATH TABLES

Age	Rates of Death[1]		Age	Rates of Death[1]	
	Male	Female		Male	Female
19	0.000318	0.000187	**45**	0.001450	0.001379
20	0.000332	0.000189	**46**	0.001554	0.001491
21	0.000343	0.000193	**47**	0.001668	0.001612
22	0.000352	0.000199	**48**	0.001789	0.001781
23	0.000359	0.000206	**49**	0.001919	0.001941
24	0.000362	0.000214	**50**	0.002056	0.002122
25	0.000362	0.000226	**51**	0.002355	0.002331
26	0.000364	0.000239	**52**	0.002565	0.002613
27	0.000367	0.000254	**53**	0.002804	0.002972
28	0.000378	0.000295	**54**	0.003074	0.003301
29	0.000396	0.000337	**55**	0.003485	0.003676
30	0.000427	0.000379	**56**	0.004039	0.004107
31	0.000480	0.000418	**57**	0.004455	0.004614
32	0.000540	0.000457	**58**	0.004940	0.005238
33	0.000607	0.000494	**59**	0.005498	0.005919
34	0.000675	0.000533	**60**	0.006158	0.006711
35	0.000743	0.000575	**61**	0.006915	0.007465
36	0.000809	0.000623	**62**	0.007786	0.008296
37	0.000869	0.000679	**63**	0.008786	0.009363
38	0.000927	0.000744	**64**	0.009769	0.010396
39	0.000982	0.000819	**65**	0.010887	0.011492
40	0.001038	0.000901	**66**	0.012155	0.012702
41	0.001098	0.000990	**67**	0.013383	0.014310
42	0.001168	0.001081	**68**	0.014683	0.015880
43	0.001249	0.001176	**69**	0.016270	0.017663
44	0.001343	0.001275			

1. The base table will be projected beyond the valuation date using the Buck Modified MP-2014.

TABLE 5

MORTALITY TABLES FOR SERVICE RETIREMENTS AND BENEFICIARIES OF DECEASED ACTIVE AND RETIRED MEMBERS

AGE	RATES OF MORTALITY[1]		AGE	RATES OF MORTALITY[1]	
	MALE	FEMALE		MALE	FEMALE
19	0.000318	0.000187	**65**	0.010887	0.011492
20	0.000332	0.000189	**66**	0.012155	0.012702
21	0.000343	0.000193	**67**	0.013383	0.014310
22	0.000352	0.000199	**68**	0.014683	0.015880
23	0.000359	0.000206	**69**	0.016270	0.017663
24	0.000362	0.000214	**70**	0.018245	0.019634
25	0.000362	0.000226	**71**	0.020187	0.021760
26	0.000364	0.000239	**72**	0.022415	0.024024
27	0.000367	0.000254	**73**	0.024967	0.026468
28	0.000378	0.000295	**74**	0.027853	0.029151
29	0.000396	0.000337	**75**	0.031085	0.032134
30	0.000427	0.000379	**76**	0.034647	0.035477
31	0.000480	0.000418	**77**	0.038539	0.039215
32	0.000540	0.000457	**78**	0.042825	0.043404
33	0.000607	0.000494	**79**	0.047594	0.048117
34	0.000675	0.000533	**80**	0.052886	0.053427
35	0.000743	0.000575	**81**	0.059190	0.059420
36	0.000809	0.000623	**82**	0.066129	0.066197
37	0.000869	0.000679	**83**	0.073714	0.073830
38	0.000927	0.000744	**84**	0.081980	0.082344
39	0.000982	0.000819	**85**	0.091000	0.091717
40	0.001038	0.000901	**86**	0.100892	0.101847
41	0.001098	0.000990	**87**	0.113260	0.112555
42	0.001168	0.001081	**88**	0.127034	0.123601
43	0.001249	0.001176	**89**	0.142248	0.134724
44	0.001343	0.001275	**90**	0.158844	0.147606
45	0.001450	0.001379	**91**	0.175301	0.160410
46	0.001554	0.001491	**92**	0.192587	0.172941
47	0.001668	0.001612	**93**	0.210494	0.185015
48	0.001789	0.001781	**94**	0.228814	0.196455
49	0.001919	0.001941	**95**	0.247362	0.207094
50	0.002056	0.002122	**96**	0.265995	0.216790
51	0.002355	0.002331	**97**	0.284628	0.225411
52	0.002565	0.002613	**98**	0.299288	0.232404
53	0.002804	0.002972	**99**	0.317558	0.244749
54	0.003074	0.003301	**100**	0.331358	0.255853
55	0.003485	0.003676	**101**	0.349415	0.271886
56	0.004039	0.004107	**102**	0.362136	0.285586
57	0.004455	0.004614	**103**	0.378090	0.303833
58	0.004940	0.005238	**104**	0.386937	0.318555
59	0.005498	0.005919	**105**	0.397886	0.337441
60	0.006158	0.006711	**106**	0.400000	0.351544
61	0.006915	0.007465	**107**	0.400000	0.364617
62	0.007786	0.008296	**108**	0.400000	0.376246
63	0.008786	0.009363	**109**	0.400000	0.386015
64	0.009769	0.010396	**110**	0.400000	0.393507

1. The base table will be projected beyond the valuation date using the Buck Modified MP-2014.

TABLE 6

MORTALITY TABLES FOR DISABILITY RETIREMENTS

AGE	RATES OF MORTALITY		AGE	RATES OF MORTALITY	
	MALE	FEMALE		MALE	FEMALE
21	0.022571	0.007450	70	0.069405	0.042851
22	0.022571	0.007450	71	0.073292	0.045769
23	0.022571	0.007450	72	0.077512	0.048895
24	0.022571	0.007450	73	0.082067	0.052230
25	0.022571	0.007450	74	0.086951	0.055777
26	0.022571	0.007450	75	0.092149	0.059545
27	0.022571	0.007450	76	0.097640	0.063545
28	0.022571	0.007450	77	0.103392	0.067793
29	0.022571	0.007450	78	0.109372	0.072312
30	0.022571	0.007450	79	0.115544	0.077135
31	0.022571	0.007450	80	0.121877	0.082298
32	0.022571	0.007450	81	0.128343	0.087838
33	0.022571	0.007450	82	0.134923	0.093794
34	0.022571	0.007450	83	0.141603	0.100203
35	0.022571	0.007450	84	0.148374	0.107099
36	0.022571	0.007450	85	0.155235	0.114512
37	0.022571	0.007450	86	0.162186	0.122464
38	0.022571	0.007450	87	0.169233	0.130972
39	0.022571	0.007450	88	0.183408	0.140049
40	0.022571	0.007450	89	0.199769	0.149698
41	0.022571	0.007450	90	0.216605	0.159924
42	0.022571	0.007450	91	0.233662	0.170433
43	0.022571	0.007450	92	0.250693	0.182799
44	0.023847	0.008184	93	0.267491	0.194509
45	0.025124	0.008959	94	0.283905	0.205379
46	0.026404	0.009775	95	0.299852	0.215240
47	0.027687	0.010634	96	0.315296	0.223947
48	0.028975	0.011535	97	0.330207	0.231387
49	0.030268	0.012477	98	0.344556	0.237467
50	0.031563	0.013456	99	0.358628	0.244834
51	0.032859	0.014465	100	0.371685	0.254498
52	0.034152	0.015497	101	0.383040	0.266044
53	0.035442	0.016544	102	0.392003	0.279055
54	0.036732	0.017598	103	0.397886	0.293116
55	0.038026	0.018654	104	0.400000	0.307811
56	0.039334	0.019710	105	0.400000	0.322725
57	0.040668	0.020768	106	0.400000	0.337441
58	0.042042	0.021839	107	0.400000	0.351544
59	0.043474	0.022936	108	0.400000	0.364617
60	0.044981	0.024080	109	0.400000	0.376246
61	0.046584	0.025293	110	0.400000	0.386015
62	0.048307	0.026600	111	0.400000	0.393507
63	0.050174	0.028026	112	0.400000	0.398308
64	0.052213	0.029594	113	0.400000	0.400000
65	0.054450	0.031325	114	0.400000	0.400000
66	0.056909	0.033234	115	0.400000	0.400000
67	0.059613	0.035335	116	0.400000	0.400000
68	0.062583	0.037635	117	0.400000	0.400000
69	0.065841	0.040140	118	1.000000	1.000000