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November 7, 2011

The Board of Trustees
District of Columbia Retirement Board
900 7th Street, NW, 2nd Floor
Washington, DC 20001

Dear Trustees:

Enclosed are 20 copies of the “District of Columbia Retirement Board Experience Investigation for the Four-Year Period Ending September 30, 2010”. The investigation includes the economic and demographic experience for the District of Columbia Retirement Board.

Please let us know if there are any questions concerning this report.

Sincerely,

Thomas J. Cavanaugh, FSA, FCA, EA, MAAA
Chief Executive Officer

Edward J. Koebel, EA, FCA, MAAA
Principal and Consulting Actuary

EJK/EG:dmw

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District of Columbia Retirement Board

Teachers' Retirement Plan and Police Officers' & Firefighters' Retirement Plan

Experience Investigation for the Four-Year Period Ending September 30, 2010





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November 7, 2011

The Board of Trustees
District of Columbia Retirement Board
900 7th Street, NW, 2nd Floor
Washington, DC 20001

Dear Trustees:

We are pleased to submit the results of an investigation of the economic and demographic experience for the District of Columbia Retirement Board. The purpose of the investigation was to assess the reasonability of the actuarial assumptions for the System. This investigation covers the four-year period from October 1, 2006 to September 30, 2010. As a result of the investigation, it is recommended that revised tables be adopted by the Board for future use.

The investigation of the experience of members of the System includes all active and retired members as well as beneficiaries of deceased members.

The results of the investigation indicate that the assumed rates of separation from active service due to withdrawal, disability, death and retirement, and rates of salary increase and post-retirement mortality do not accurately reflect the actual and anticipated experience of the Retirement System. As a result of the investigation, new withdrawal, disability, retirement, salary increase and mortality tables have been developed which reflect more closely the actual experience of the membership.

This report shows a comparison of the actual and expected cases of separation from active service, actual and expected number of deaths, and actual and expected salary increases. These tables are shown based on current assumed expected rates and based on new proposed expected rates. A comparison between the rates of separation and mortality presently in use and the recommended revised rates are also shown in this report.

All rates of separation, mortality and salary increase at each age for each system are shown in the attached tables in Appendix D of this report. In the actuary's judgment, the rates recommended are suitable for use until further experience indicates that modifications are desirable.

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The experience investigation was performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems. The undersigned meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Thomas J. Cavanaugh', with a stylized flourish at the end.

Thomas J. Cavanaugh, FSA, FCA, EA, MAAA
Chief Executive Officer

A handwritten signature in blue ink, appearing to read 'Edward J. Koebel', with a stylized flourish at the end.

Edward J. Koebel, EA, FCA, MAAA
Principal and Consulting Actuary

EJK/EG:dmw



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Section I Executive Summary

The following summarizes the findings and recommendations with regard to the assumptions utilized for the District of Columbia Retirement Board. Detailed explanations for the recommendations are found in the sections that follow.

Economic Assumption Changes

The table below lists the three economic assumptions used in the actuarial valuations and their current and proposed rates.

Item	Current	Proposed
Price Inflation	4.25%	3.75%
Investment Return	7.00%	7.00%
Wage Inflation	4.75%	4.50%

Recommended Demographic Assumption Changes

The table below lists the demographic assumptions that should be changed based on the experience of the last five years.

Assumption	Changes
Withdrawal	Changes to Teachers, Police Officers and Firefighters
Disability Retirement	Changes to Teachers, Police Officers and Firefighters
Service Retirement	Changes to Teachers, Police Officers and Firefighters
Mortality	Changes to Teachers, Police Officers and Firefighters
Salary Scale	No Changes



Financial Impact

The following tables highlight the impact of the recommended changes on the Normal Contribution Rate under the Aggregate Method and the Funding Ratio for each Plan of DCRB.

Teachers' Retirement Plan

	Valuation Results 2010	Proposed Economic Changes Only	Proposed Demographic Changes Only	Demographic and Economic Changes
Normal Contribution Rate	0.00%	0.00%	0.00%	0.00%
Normal Contribution Dollar	\$0	\$0	\$0	\$0
Funding Ratio	118.3%	119.0%	116.2%	116.8%

Police Officers' Retirement Plan

	Valuation Results 2010	Proposed Economic Changes Only	Proposed Demographic Changes Only	Demographic and Economic Changes
Normal Contribution Rate	26.35%	24.79%	20.65%	19.19%
Normal Contribution Dollar	\$76,023	\$70,942	\$57,457	\$52,702
Funding Ratio	108.2%	108.9%	110.4%	110.9%

Fire Fighters' Retirement Plan

	Valuation Results 2010	Proposed Economic Changes Only	Proposed Demographic Changes Only	Demographic and Economic Changes
Normal Contribution Rate	30.29%	28.69%	25.04%	23.48%
Normal Contribution Dollar	\$40,642	\$38,413	\$33,325	\$31,151
Funding Ratio	107.2%	108.0%	109.5%	110.2%



Section II Economic Assumptions

There are three economic assumptions used in the actuarial valuations performed for DCRB. They are:

- Price Inflation
- Investment Return
- Wage Inflation

The Actuarial Standards Board has issued Actuarial Standard of Practice (ASOP) No. 27, “*Selection of Economic Assumptions for Measuring Pension Obligations*”, which provides guidance to actuaries in selecting economic assumptions for measuring obligations under defined benefit plans. As noted in ASOP No. 27, because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes based on a mixture of past experience and future expectations. These estimates therefore are best stated as a range utilizing the actuary’s professional judgment. In setting the range and the single point within that range to use, the actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

In our opinion, the economic assumptions recommended in this report have been developed in accordance with ASOP No. 27. The following table shows our recommendations followed by detailed discussions of each assumption.

Item	Current	Proposed
Price Inflation	4.25%	3.75%
Real Rate of Return	<u>2.75</u>	<u>3.25</u>
Investment Return	7.00%	7.00%
Price Inflation	4.25%	3.75%
Real Wage Growth	<u>0.50</u>	<u>0.75</u>
Wage Inflation	4.75%	4.50%



Price Inflation

Background: As can be seen from the table on the previous page, assumed price inflation is used as the basis for both the investment return assumption and the wage inflation assumption. These latter two assumptions will be discussed in detail in the following sections.

It is important that the price inflation assumption be consistently applied throughout the economic assumptions utilized in an actuarial valuation. This is called for in ASOP No. 27 and is also required to meet the parameters for determining pension liabilities and expense under Governmental Accounting Standards Board (GASB) Statements No. 25 and 27.

The current price inflation assumption is 4.25% per year.

Past Experience: The Consumer Price Index, US City Average, All Urban Consumers, CPI (U), has been used as the basis for reviewing historical levels of price inflation. The level of that index in September of each of the last 50 years is provided in Appendix A.

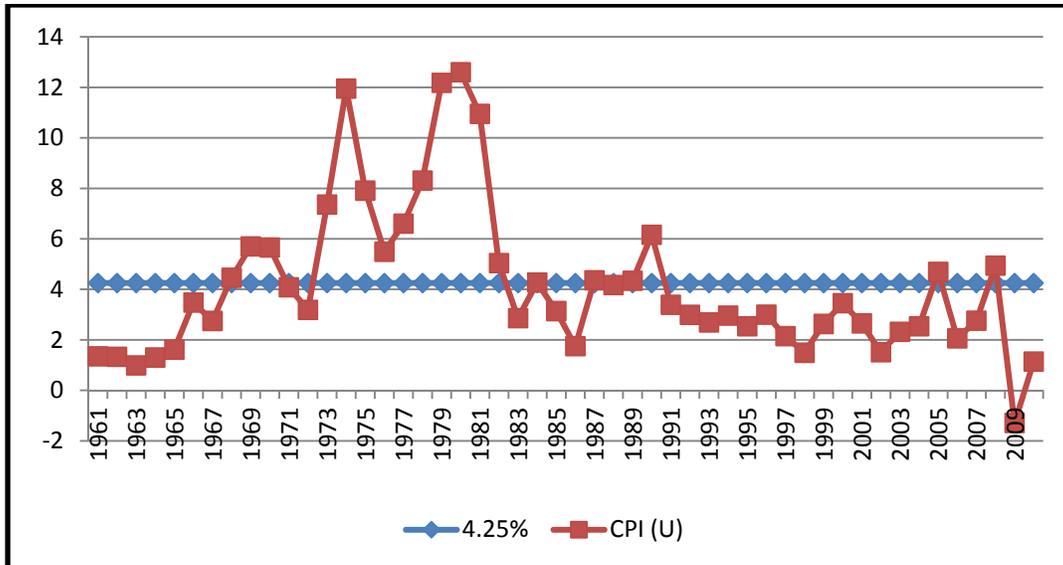
In analyzing this data, annual rates of inflation have been determined by measuring the compound growth rate of the CPI (U) over various time periods. The results are as follows:

Period	Inflation
2001-2010	2.32%
1991-2000	2.73
1981-1990	4.68
1971-1980	7.92
1961-1970	2.85
1991-2010	2.52%
1981-2010	3.24
1971-2010	4.39
1961-2010	4.08

The graph below shows the annual increases in the CPI (U) over the entire 50 year period.



Annual CPI (U) Increases



Recommendation: It is difficult to accurately predict inflation. Inflation’s short-term volatility is illustrated by comparing its average rate over the last 10, 40 and 50 years. Although the 10-year average of 2.32% is significantly lower than DCRB’s assumed rate of 4.25%, the longer 40 and 50-year averages of 4.39% and 4.08% respectively, are all very close to DCRB’s rate. The validity of DCRB’s assumption is, therefore, dependent upon the emphasis one assigns to the short and long-terms.

Current economic forecasts suggest lower inflation but are generally looking at a shorter time period than appropriate for our purposes. In the 2010 OASDI Trustees Report, the Chief Actuary for Social Security bases the 75 year cost projections on an intermediate inflation assumption of 2.8% with a range of 1.8% to 3.8%. We concur in general with a range of 2.0% - 4.0%, and recommend use of a 3.75% per year rate recognizing the likely inflation pressures built into the economy at the current time.

Price Inflation Assumption	
Current	4.25%
Reasonable Range	2.00% - 4.00%
Recommended	3.75%



Investment Return

Background: The assumed investment return is one of the most significant assumptions in the annual actuarial valuation process as it is used to discount the expected benefit payments for all active, inactive and retired members of the divisions. Minor changes in this assumption can have a major impact on valuation results. The investment return assumption should reflect the asset allocation target for the funds set by the Board of Trustees.

The current assumption is 7.00%, consisting of a price inflation assumption of 4.25% and a real rate of return assumption of 2.75%. The return is net of all investment and administrative expenses.

Past Experience: The assets for DCRB are valued using a widely accepted asset-smoothing methodology that fully recognizes the expected investment income and also recognizes 1/7th of each year's investment gain or loss (the difference between actual and expected investment income). The recent experience over the last four years is shown in the table below.

Year Ending 9/30	Actuarial Value	Market Value
2007	11.70%	16.40%
2008	(0.23)	(17.17)
2009	(5.86)	(2.64)
2010	1.60	10.38
Average	1.61%	0.89%

Because of the significant variability in past year-to-year results and the inter-play of inflation on those results in the short term, we prefer to base our investment return assumption on the capital market assumptions utilized by the Board in setting investment policy and the asset allocation established by the Board as a result of that policy. This approach is referred to as the building block method in ASOP No. 27.

Analysis: The current capital market assumptions and asset allocation are shown in Appendix B. Using stochastic projection results provides an expected range of real rates of return over a 50 year time horizon. Looking at one year results produces an expected real return of 4.32% but also has a high standard deviation or measurement of volatility. By expanding the time horizon, the average return does not change much but the volatility declines significantly. The following table provides a summary of results.



Time Span In Years	Mean Real Return	Standard Deviation	Real Returns by Percentile				
			5 th	25 th	50 th	75 th	95 th
1	4.99%	12.52%	-14.44%	-3.81%	4.32%	12.89%	26.17%
5	4.38	5.52	-4.44	0.74	4.28	7.97	13.87
10	4.25	3.90	-2.02	1.65	4.20	6.81	10.78
20	4.18	2.74	-0.30	2.37	4.16	6.00	8.69
30	4.22	2.23	0.59	2.71	4.24	5.67	7.97
40	4.20	1.96	1.01	2.85	4.16	5.49	7.44
50	4.19	1.76	1.30	3.01	4.18	5.37	7.06

The percentile results are percentage of the 5,000 random results that produce returns over the time span shown of less than the amount indicated. Thus for the 10 year time span, 5% of the resulting real rates of return were below -2.02% and 95% were above that. As the time span increases, the results begin to merge. Over a 50 year time span, the results indicate there is a 25% chance that real returns will be below 3.01% and a 25% chance they will be above 5.37%. In other words there is a 50% chance the real returns will be between 3.01% and 5.37%.

Administrative and Investment Expenses: The investment return is assumed to be net of administrative and investment expenses. The table below compares, for the last four years, the expense levels during the fiscal year to the market value of assets for the systems at the end of the fiscal year (all \$ in thousands).

FY Ending September 30	Administrative Expenses	Investment Expenses	Total Expenses	Market Value of Assets	Expense Ratio
2007	\$8,322	\$12,543	\$20,865	\$4,371,373	0.48%
2008	8,669	12,447	21,116	3,734,480	0.56
2009	7,244	12,262	19,506	3,729,385	0.52
2010	7,472	13,479	20,951	4,243,212	0.49

Based on the results above we would normally recommend a 0.50% assumption for expenses going forward. However, it is our understanding that administrative expenses are expected to increase significantly in the near term due to several current projects underway with an expectation that additional ongoing maintenance expenses will be realized once those projects are complete. We therefore recommend using 0.65% as the expense assumption.



Recommendation: Using the building block approach of ASOP No. 27 and the projection results outlined above, we are recommending a range for the investment return assumption of the 25th to 75th percentile real returns over the 50 year time span plus the recommended inflation assumption less the recommended expense ratio. The following table details the range.

Item	25 th Percentile	50 th Percentile	75 th Percentile
Real Rate of Return	3.01%	4.18%	5.37%
Proposed Inflation	3.75	3.75	3.75
Total Expenses	<u>(0.65)</u>	<u>(0.65)</u>	<u>(0.65)</u>
Net Investment Return	6.11%	7.28%	8.47%

There is 50% chance that the net return will be 7.28% or more over a 50-year period. A net return of 7.00% is at the 41st percentile. In other words there is approximately a 60% chance that the long term rate of return will be above 7.00%. Although not in the center of the recommended range, in our opinion a 7.00% assumption is very reasonable particularly given the issues surrounding the accuracy of the current member data available to DCRB.

Investment Return Assumption	
Current	7.00%
Reasonable Range	6.11% - 8.47%
Recommended	7.00%



Wage Inflation

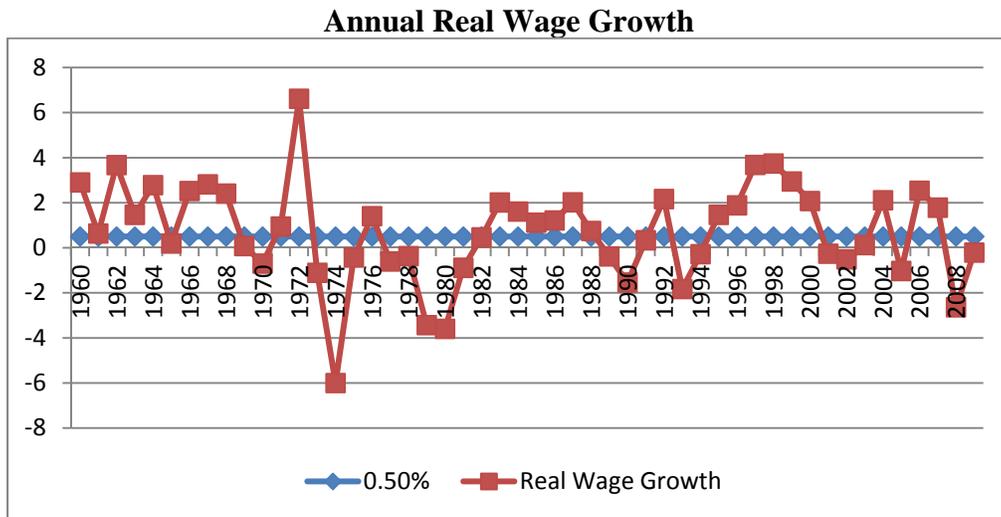
Background: The assumed future increases in salaries consist of an inflation component and a component for promotion and longevity, often called merit increases. The latter are generally age and or service related, and will be dealt with in the demographic assumption section of the report. Wage inflation normally is above price inflation as a reflection of the overall return on labor in the economy.

The current wage inflation assumption is 4.75%, or 0.50% above current price inflation.

Past Experience: The Social Security Administration publishes data on wage growth in the United States. Appendix C shows the last 50 calendar years' data. As with our analysis of inflation, we provide below wage inflation and a comparison with price inflation over various time periods. Since wage data is only available through 2009 we use that year as the starting point.

Period	Wage Inflation	Price Inflation	Real Wage Growth
2000-2009	2.94%	2.55%	0.39%
1990-1999	4.25	2.99	1.26
1980-1989	5.76	5.30	0.46
1970-1979	6.89	7.23	(0.34)
1960-1969	4.33	2.39	1.94
1990-2009	3.59	2.77	0.82
1980-2009	4.31	3.61	0.70
1970-2009	4.95	4.50	0.45
1960-2009	4.83	4.08	0.75

Thus over the last 50 years, annual real wage growth has averaged 0.75%.



Recommendation: As with price inflation, we again look at the 2010 OASDI Trustees Report. The Chief Actuary for Social Security bases the 75 year cost projections on a national wage growth assumption 1.2% greater than the price inflation assumption of 2.8%. We concur in general with a range of .5% to 1.5%, and recommend use of a 0.75% per year rate at the current time which, when added to the proposed Price Inflation rate, will make the recommended Wage Inflation Assumption rate equal to 4.50%.

Wage Inflation Assumption		
Current	4.75%	
	Reasonable Range	
Real Wage Growth	0.50%	1.50%
Proposed Inflation	<u>3.75</u>	<u>3.75</u>
Total	4.25%	5.25%
Recommended	4.50%	



Section III Demographic Assumptions

There are several demographic assumptions used in the actuarial valuations performed for the District of Columbia. They are:

- Rates of Withdrawal
- Rates of Disability Retirement
- Rates of Service Retirement
- Rates of Mortality
- Rates of Salary Increase

The Actuarial Standards Board has issued Actuarial Standard of Practice (ASOP) No. 35, “*Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*”, which provides guidance to actuaries in selecting demographic assumptions for measuring obligations under defined benefit plans. In our opinion, the demographic assumptions recommended in this report have been developed in accordance with ASOP No. 35.

The purpose of a study of demographic experience is to compare what actually happened to the membership during the study period (October 1, 2006, through September 30, 2010) with what was expected to happen based on the assumptions used in the most recent Actuarial Valuations.

Detailed tabulations by age, service and/or gender are performed over the entire study period. These tabulations look at all active and retired members during the period as well as separately annotating those who experience a demographic event, also referred to as a decrement. In addition the tabulation of all members together with the current assumptions permits the calculation of the number of expected decrements during the study period.

If the actual experience differs significantly from the overall expected results, or if the pattern of actual decrements, or rates of decrement, by age, gender, or service does not follow the expected pattern, new assumptions are recommended. Recommended changes usually do not follow the exact actual experience during the observation period. Judgment is required to extrapolate future experience from past trends and current member behavior. In addition non-recurring events, such as early retirement windows, need to be taken into account in determining the weight to give to recent experience.

The remainder of this section presents the results of the demographic study. We have prepared tables that show a comparison of the actual and expected decrements and the overall ratio of actual to expected results (A/E Ratios) under the current assumptions. If a change is being proposed, the revised A/E Ratios are shown as well. Salary adjustments, other than the economic assumption for wage inflation discussed in the previous section, are treated as demographic assumptions.



TEACHERS' RETIREMENT PLAN

RATES OF WITHDRAWAL

**COMPARISON OF ACTUAL AND EXPECTED WITHDRAWALS
FROM ACTIVE SERVICE**

CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS		
	Actual	Expected	Ratio of Actual to Expected
	Withdrawals with less than 4 years of service		
20	10	27	0.370
25	368	399	0.922
30	264	230	1.148
35	183	159	1.151
40	117	96	1.219
45	75	62	1.210
50	50	40	1.250
55	53	41	1.293
60	60	33	1.818
TOTAL	1,180	1,087	1.086

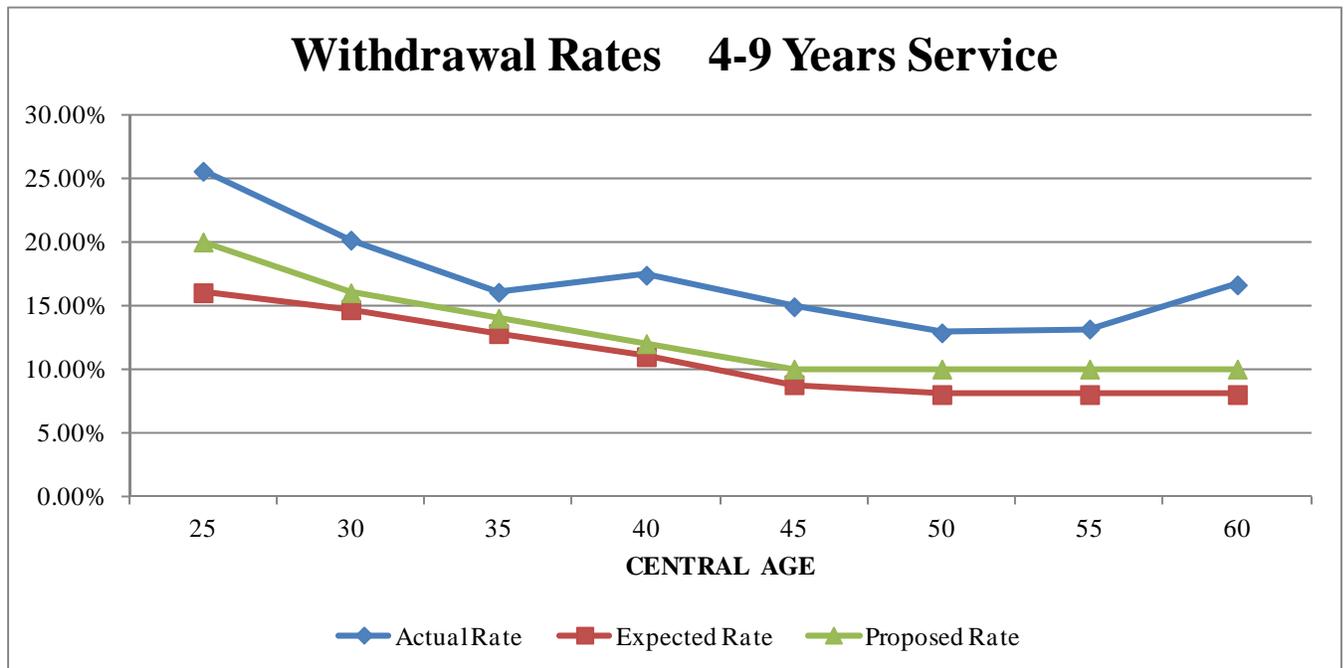
CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS		
	Actual	Expected	Ratio of Actual to Expected
	Withdrawals with 4 to 9 years of service		
25	57	36	1.583
30	170	124	1.371
35	175	140	1.250
40	117	74	1.581
45	76	45	1.689
50	69	43	1.605
55	73	44	1.659
60	64	31	2.065
TOTAL	801	537	1.492

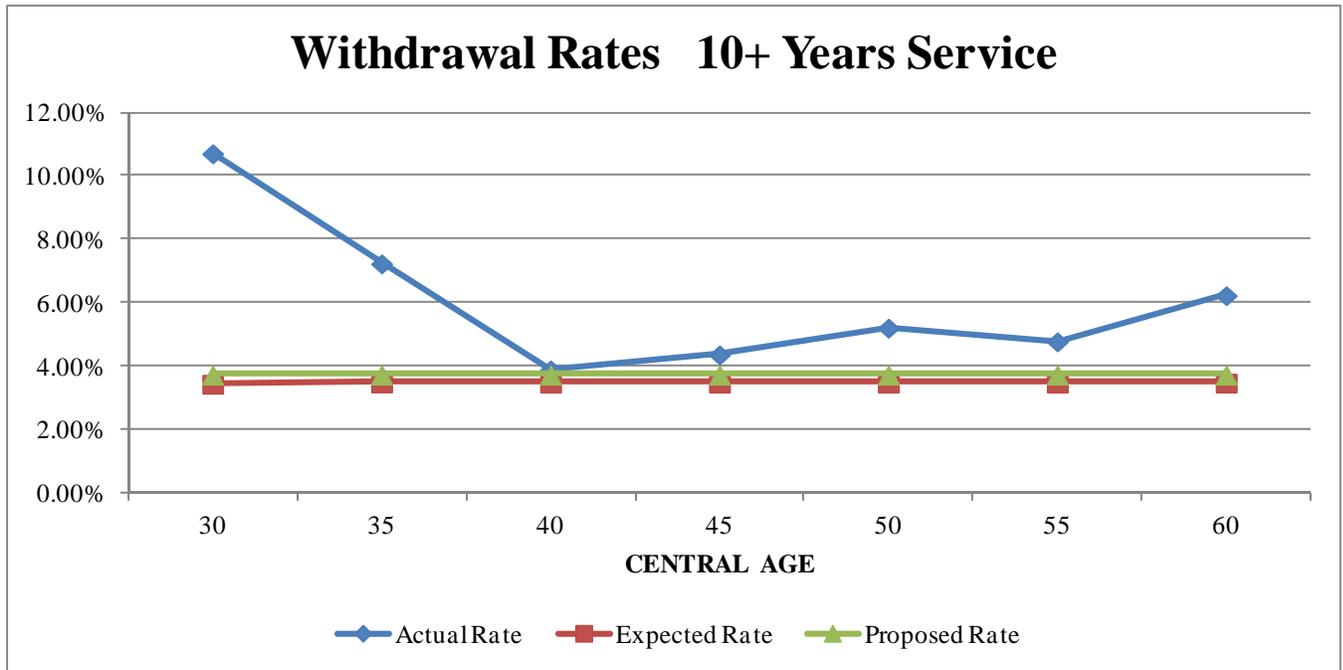


CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS		
	Actual	Expected	Ratio of Actual to Expected
	Withdrawals with 10 or more years of service		
30	3	1	3.000
35	29	14	2.071
40	25	22	1.136
45	39	31	1.258
50	47	31	1.516
55	33	24	1.375
60	33	18	1.833
TOTAL	209	141	1.482

The following graph shows a comparison of the present, actual and proposed rates of withdrawal.

RATES OF WITHDRAWAL FOR ACTIVE MEMBERS





The rates of withdrawal adopted by the Board are used to determine the expected number of separations from active service which will occur as a result of resignation or dismissal. The preceding results indicate that the actual number of withdrawals is more than expected at most age and service breakdowns. However, after Board concern for possible anomalies in the data during this 4-year period which inflated the actual occurrences we have developed our proposed rates taking this information into consideration.



The following table shows a comparison between the present withdrawal rates and the proposed withdrawal rates for members with five or more years of service.

COMPARATIVE RATES OF WITHDRAWAL

AGE	RATES OF WITHDRAWAL			
	Less than 4 years of service		4 to 9 years of service	
	Present	Proposed	Present	Proposed
20	25.0%	25.0%	18.0%	20.0%
25	23.5%	23.5%	16.0%	20.0%
30	22.0%	22.0%	14.0%	16.0%
35	20.5%	20.5%	12.0%	14.0%
40	19.0%	19.0%	10.0%	12.0%
45	17.5%	17.5%	8.0%	10.0%
50	16.0%	16.0%	8.0%	10.0%
55	14.5%	14.5%	8.0%	10.0%
60	13.0%	13.0%	8.0%	10.0%

In addition, for members with 10 or more years of service, we recommend changing the assumed rate of withdrawal from 3.50% to 3.75% at all ages.

COMPARISON OF ACTUAL AND EXPECTED WITHDRAWALS FROM ACTIVE SERVICE BASED ON PROPOSED RATES

CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS		
	Actual	Expected	Ratio of Actual to Expected
	Withdrawals with 4 to 9 years of service		
25	57	45	1.267
30	170	135	1.259
35	175	153	1.144
40	117	81	1.444
45	76	51	1.490
50	69	54	1.278
55	73	56	1.304
60	64	39	1.641
TOTAL	801	614	1.305



CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS		
	Actual	Expected	Ratio of Actual to Expected
	Withdrawals with 10 or more years of service		
30	3	1	3.000
35	29	15	1.933
40	25	24	1.042
45	39	33	1.182
50	47	34	1.382
55	33	26	1.269
60	33	20	1.650
TOTAL	209	153	1.366



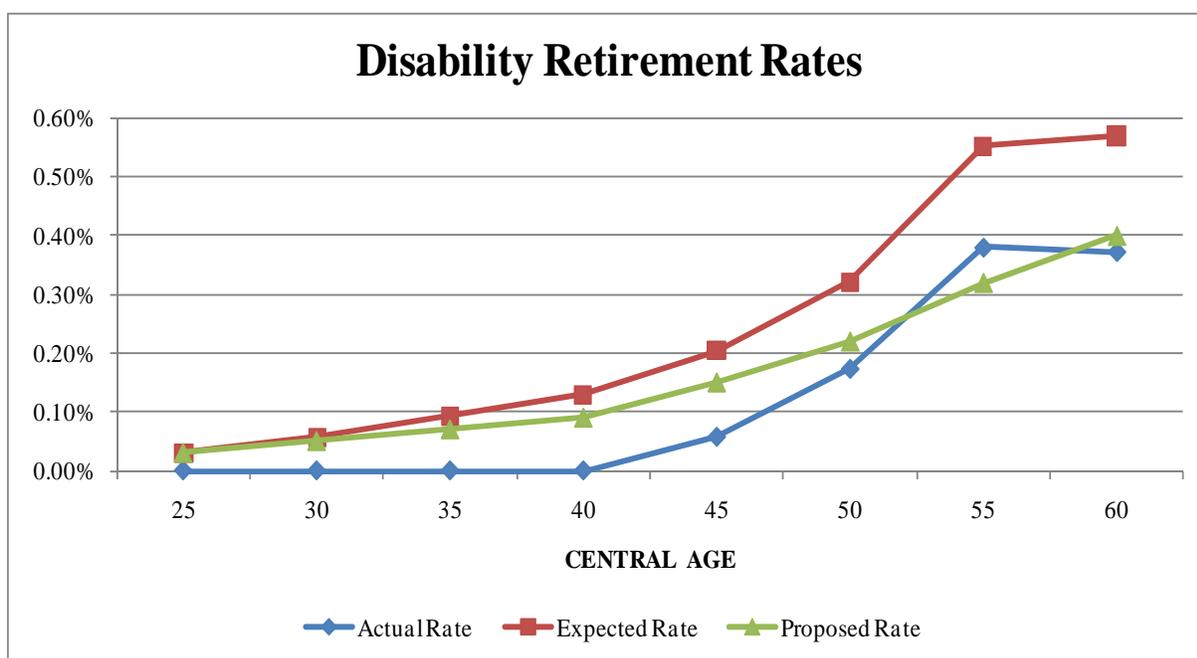
TEACHERS' RETIREMENT PLAN

RATES OF DISABILITY RETIREMENT

COMPARISON OF ACTUAL AND EXPECTED DISABILITY RETIREMENTS

CENTRAL AGE OF GROUP	NUMBER OF DISABILITY RETIREMENTS		
	Actual	Expected	Ratio of Actual to Expected
25	0	1	0.000
30	0	1	0.000
35	0	2	0.000
40	0	2	0.000
45	1	4	0.250
50	4	8	0.500
55	12	17	0.706
60	11	12	0.917
TOTAL	28	47	0.596

The following graphs show a comparison of the present, actual, and proposed rates of disability retirements.





During the period under investigation, the actual rates of disability retirement were significantly less than expected over all age groups. Therefore, we recommend the rates of disability retirement be revised to more closely reflect the experience of the System.

The following table shows a comparison between the present disability retirement rates and the proposed rates.

COMPARATIVE RATES OF DISABILITY RETIREMENT

AGE	RATES OF DISABILITY RETIREMENT	
	Present	Proposed
25	0.03%	0.03%
30	0.06%	0.05%
35	0.09%	0.07%
40	0.13%	0.09%
45	0.20%	0.15%
50	0.32%	0.22%
55	0.55%	0.32%
60	0.57%	0.40%

**COMPARISON OF ACTUAL AND EXPECTED DISABILITY RETIREMENTS
BASED ON PROPOSED RATES**

CENTRAL AGE OF GROUP	NUMBER OF DISABILITY RETIREMENTS		
	Actual	Expected	Ratio of Actual to Expected
25	0	1	0.000
30	0	1	0.000
35	0	2	0.000
40	0	2	0.000
45	1	3	0.333
50	4	5	0.800
55	12	10	1.200
60	11	11	1.000
TOTAL	28	35	0.800



TEACHERS' RETIREMENT PLAN

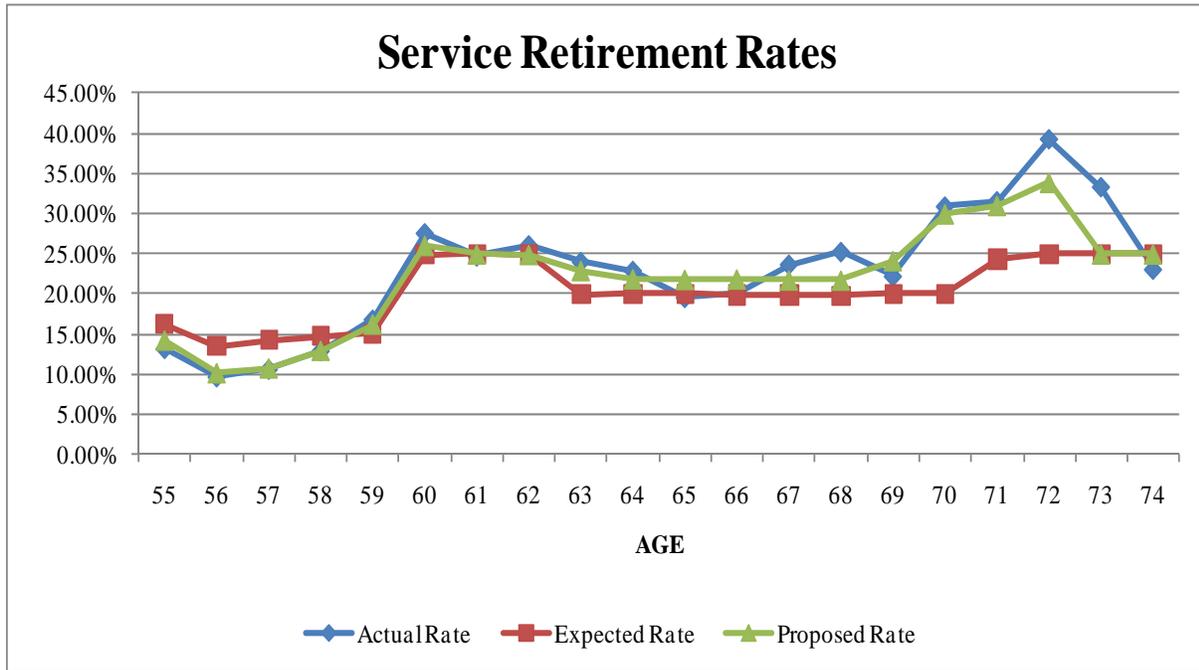
RATES OF SERVICE RETIREMENT

COMPARISON OF ACTUAL AND EXPECTED RETIREMENTS

AGE	NUMBER OF SERVICE RETIREMENTS		
	Actual	Expected	Ratio of Actual to Expected
Under 55	36	6	6.000
55	45	55	0.818
56	34	47	0.723
57	41	55	0.745
58	54	62	0.871
59	65	58	1.121
60	96	87	1.103
61	64	65	0.985
62	101	97	1.041
63	73	61	1.197
64	52	45	1.156
65	36	37	0.973
66	30	30	1.000
67	27	23	1.174
68	24	19	1.263
69	16	14	1.143
70	17	11	1.545
71	12	9	1.333
72	11	7	1.571
73	7	5	1.400
74	3	3	1.000
SUBTOTAL	844	796	1.060
75+	18	47	0.383
TOTAL	862	843	1.023



The following graphs show a comparison of the present and actual rates of service retirements.



The preceding results indicate that for service retirements of members, the actual number of retirements overall was very close to the expected number over this period. However, at the younger ages, the actual number was slightly less than expected and at the older ages, the actual number was slightly more than expected. Therefore, we recommend the rates of retirement be revised to more closely reflect the experience of the System.

The following table shows a comparison between the present service retirement rates and the proposed rates.



COMPARATIVE RATES OF SERVICE RETIREMENT

AGE	RATES OF SERVICE RETIREMENT			
	Less than 30 years of service		30 or more years of service	
	Present	Proposed	Present	Proposed
50	0.5%	2.5%	0.5%	2.5%
51	0.5%	2.5%	0.5%	2.5%
52	0.5%	2.5%	0.5%	2.5%
53	0.5%	2.5%	0.5%	2.5%
54	0.5%	2.5%	0.5%	2.5%
55	8.0%	6.0%	35.0%	33.0%
56	8.0%	6.0%	25.0%	19.0%
57	8.0%	6.0%	25.0%	19.0%
58	8.0%	9.0%	25.0%	19.0%
59	8.0%	10.0%	25.0%	25.0%
60	25.0%	27.0%	25.0%	25.0%
61	25.0%	25.0%	25.0%	25.0%
62	25.0%	25.0%	25.0%	25.0%
63	20.0%	22.0%	20.0%	25.0%
64	20.0%	20.0%	20.0%	25.0%
65	20.0%	20.0%	20.0%	25.0%
66	20.0%	20.0%	20.0%	25.0%
67	20.0%	20.0%	20.0%	25.0%
68	20.0%	20.0%	20.0%	25.0%
69	20.0%	20.0%	20.0%	30.0%
70	20.0%	30.0%	20.0%	30.0%
71	25.0%	25.0%	25.0%	40.0%
72	25.0%	25.0%	25.0%	50.0%
73	25.0%	25.0%	25.0%	25.0%
74	25.0%	25.0%	25.0%	25.0%
75	100.0%	100.0%	100.0%	100.0%



COMPARISON OF ACTUAL AND EXPECTED SERVICE RETIREMENTS BASED ON PROPOSED RATES

AGE	NUMBER OF SERVICE RETIREMENTS		
	Actual	Expected	Ratio of Actual to Expected
Under 55	36	36	1.000
55	45	48	0.938
56	34	36	0.944
57	41	42	0.976
58	54	54	1.000
59	65	63	1.032
60	96	91	1.055
61	64	65	0.985
62	101	97	1.041
63	73	70	1.043
64	52	50	1.040
65	36	40	0.900
66	30	33	0.909
67	27	25	1.080
68	24	21	1.143
69	16	17	0.941
70	17	17	1.000
71	12	12	1.000
72	11	10	1.100
73	7	5	1.400
74	3	3	1.000
SUBTOTAL	844	835	1.011
75+	18	47	0.383
TOTAL	862	882	0.977



TEACHERS' RETIREMENT PLAN

RATES OF MORTALITY

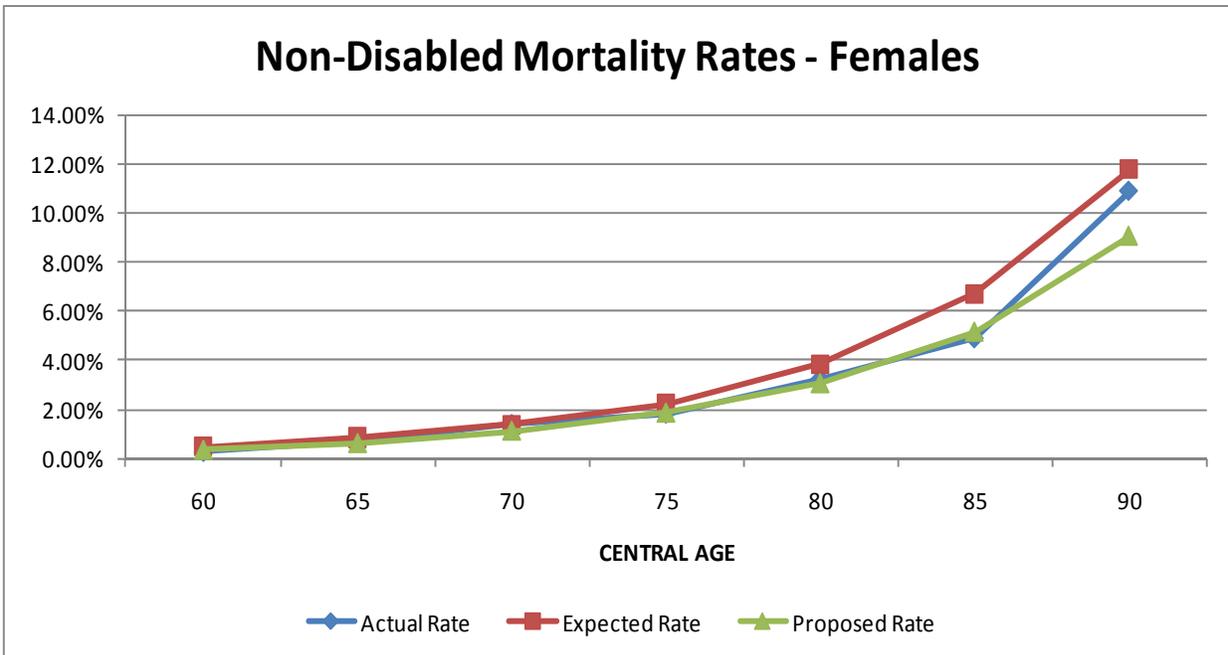
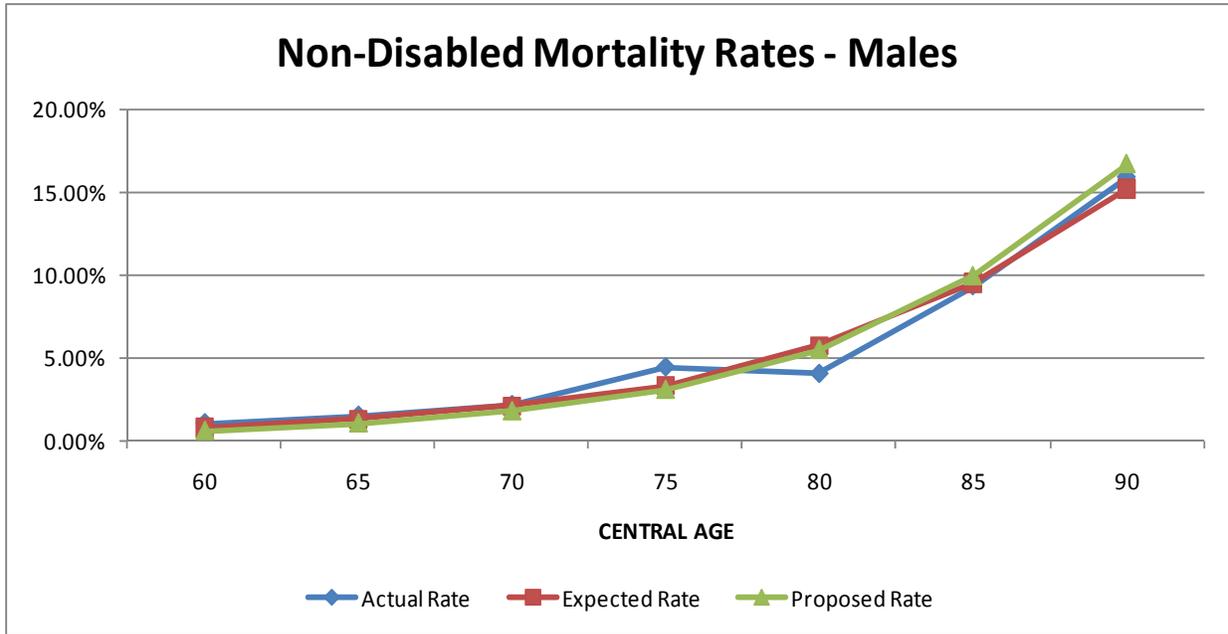
**COMPARISON OF ACTUAL AND EXPECTED CASES OF
POST-RETIREMENT DEATHS**

CENTRAL AGE OF GROUP	NUMBER OF POST-RETIREMENT DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
	SERVICE RETIREMENTS AND BENEFICIARIES					
52 and Under	1	0	0.000	0	0	0.000
55	0	0	0.000	1	1	1.000
60	6	4	1.500	6	11	0.545
65	17	15	1.133	26	32	0.813
70	16	16	1.000	43	43	1.000
75	31	23	1.348	53	65	0.815
80	18	26	0.692	71	85	0.835
85	29	30	0.967	73	100	0.730
90	21	20	1.050	92	100	0.920
95	17	14	1.214	65	74	0.878
98 & over	7	8	0.875	30	44	0.682
TOTAL	163	156	1.045	460	555	0.829
DISABILITY RETIREMENTS						
47 and Under	0	0	0.000	1	0	0.000
50	0	0	0.000	1	1	1.000
55	0	0	0.000	5	2	2.500
60	5	2	2.500	3	6	0.500
65	2	2	1.000	1	4	0.250
70	4	2	2.000	6	4	1.500
75	3	2	1.500	6	5	1.200
80	2	3	0.667	10	8	1.250
85	1	3	0.333	12	10	1.200
88 & over	8	4	2.000	17	14	1.214
TOTAL	25	18	1.389	62	54	1.148



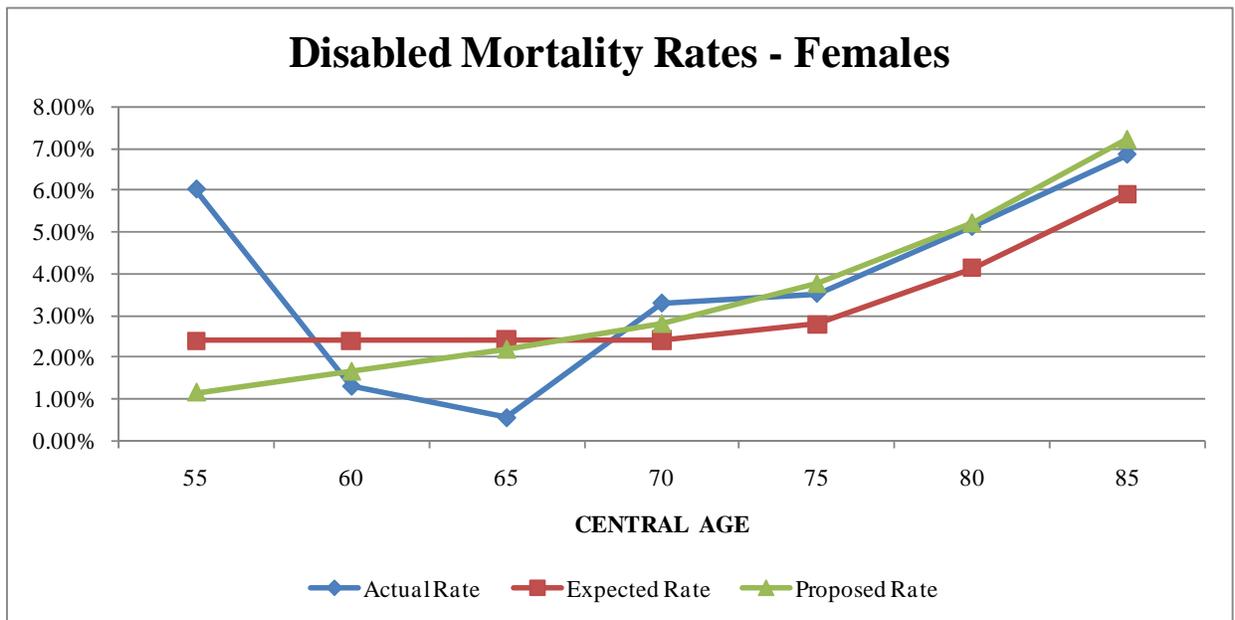
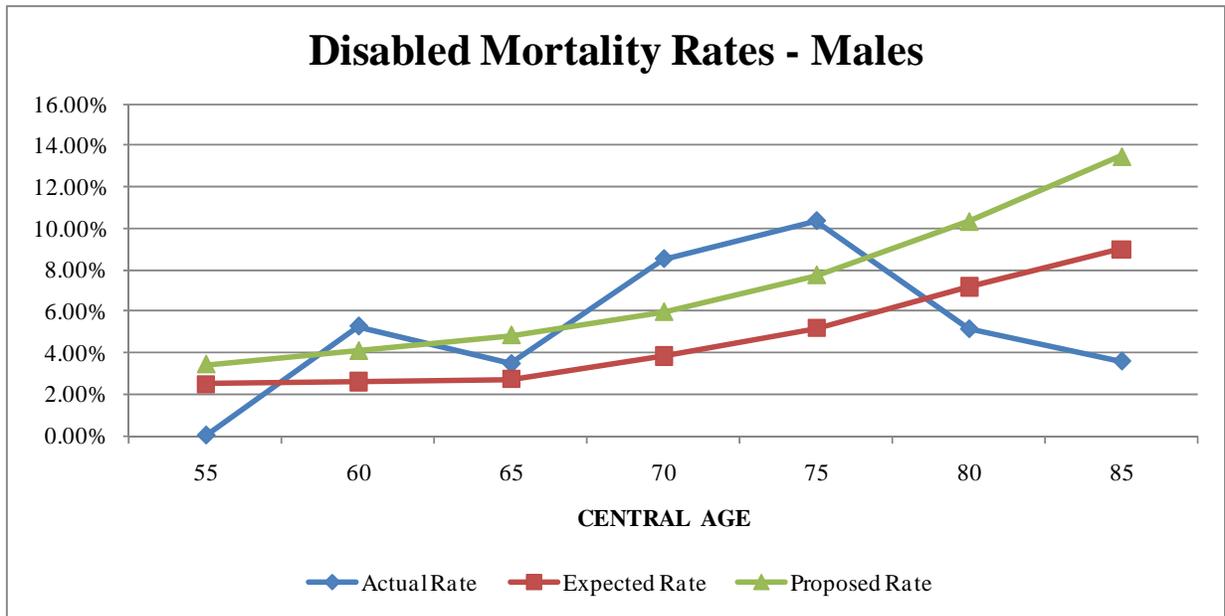
The following graphs show a comparison of the present, actual and, for disability retirements, proposed rates of post-retirement deaths.

**POST-RETIREMENT DEATHS
SERVICE RETIREMENTS AND BENEFICIARIES
OF DECEASED MEMBERS**





POST-RETIREMENT DEATHS DISABILITY RETIREMENTS





The preceding results indicate that the actual number of post-retirement deaths of service retirements for males and females was slightly more than expected for males and significantly less for females. For disability retirements, the actual mortality rates were more than expected for males and females overall.

We recommend that the rates of mortality after service retirement and for dependents of deceased pensioners be revised to the RP-2000 Combined Mortality Table projected with Scale AA to 2015, set back 3 years for females.

In addition, we recommend that the rates of mortality be revised to the RP-2000 Disabled Mortality Table (set back 1 year for males and set back 5 years for females) for disability retirements.

The following table shows a comparison between the present and proposed rates of mortality.

COMPARATIVE RATES OF POST-RETIREMENT SERVICE RETIREMENTS AND BENEFICIARIES OF DECEASED MEMBERS

AGE	RATES OF POST-RETIREMENT DEATH			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
	SERVICE RETIREMENTS AND BENEFICIARIES			
50	0.2773%	0.1628%	0.1536%	0.1025%
55	0.4758%	0.2718%	0.2466%	0.1789%
60	0.8576%	0.5297%	0.4773%	0.3226%
65	1.5629%	1.0309%	0.9286%	0.6175%
70	2.5516%	1.7702%	1.4763%	1.1282%
75	4.0012%	3.0622%	2.4393%	1.8319%
80	6.6696%	5.5360%	4.2361%	3.0694%
85	10.4559%	9.9680%	7.2836%	5.1435%
90	16.4442%	17.2706%	12.5016%	9.2092%
95	25.1189%	25.9578%	20.0229%	15.2955%



COMPARATIVE RATES OF POST-RETIREMENT DISABILITY MORTALITY

AGE	RATES OF POST-RETIREMENT DEATH			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
	DISABILITY RETIREMENTS			
45	2.4000%	2.2571%	2.4000%	0.7450%
50	2.4546%	2.7687%	2.4000%	0.7450%
55	2.5228%	3.4152%	2.4000%	1.1535%
60	2.5910%	4.0668%	2.4000%	1.6544%
65	2.6593%	4.8307%	2.4000%	2.1839%
70	3.8006%	5.9613%	2.4000%	2.8026%
75	5.2620%	7.7512%	2.7478%	3.7635%
80	7.2111%	10.3392%	4.1413%	5.2230%
85	8.3647%	13.4923%	5.8269%	7.2312%
90	13.1554%	16.9233%	10.0013%	10.0203%
95	20.0951%	25.0693%	16.0183%	14.0049%



The following shows a comparison of the actual and expected post-retirement deaths based on new revised rates of disability mortality.

**COMPARISON OF ACTUAL AND EXPECTED CASES OF
POST-RETIREMENT DEATHS BASED ON REVISED MORTALITY RATES**

CENTRAL AGE OF GROUP	NUMBER OF POST-RETIREMENT DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
	SERVICE RETIREMENTS AND BENEFICIARIES					
52 and Under	1	0	0.000	0	0	0.000
55	0	0	0.000	1	1	1.000
60	6	3	2.000	6	8	0.750
65	17	12	1.417	26	23	1.130
70	16	13	1.231	43	35	1.229
75	31	22	1.409	53	54	0.981
80	18	25	0.720	71	67	1.060
85	29	31	0.935	73	77	0.948
90	21	22	0.955	92	77	1.195
95	17	15	1.133	65	58	1.121
98 & over	7	8	0.875	30	31	0.968
TOTAL	163	151	1.079	460	431	1.067
	DISABILITY RETIREMENTS					
47 and Under	0	0	0.000	1	0	0.000
50	0	0	0.000	1	0	0.000
55	0	0	0.000	5	1	5.000
60	5	4	1.250	3	4	0.750
65	2	3	0.667	1	4	0.250
70	4	3	1.333	6	5	1.200
75	3	2	1.500	6	6	1.000
80	2	3	0.667	10	10	1.000
85	1	3	0.333	12	13	0.923
88 & over	8	5	1.600	17	14	1.214
TOTAL	25	23	1.087	62	57	1.088



TEACHERS' RETIREMENT PLAN

RATES OF SALARY INCREASE

**COMPARISON OF ACTUAL AND EXPECTED SALARIES
OF ACTIVE MEMBERS**

SERVICE OF GROUP	SALARIES AT END OF YEAR (1000's)		
	MALES AND FEMALES		
	Actual	Expected	Ratio of Actual to Expected
0	85,851	89,268	0.962
1	74,066	75,897	0.976
2	63,861	66,760	0.957
3	53,574	55,608	0.963
4	45,937	48,034	0.956
5 - 9	231,700	240,552	0.963
10 - 14	129,384	133,055	0.972
15 - 19	154,461	155,733	0.992
20 - 24	173,536	177,785	0.976
25 - 29	67,555	68,830	0.981
30 +	99,273	100,703	0.986
TOTAL	1,179,198	1,212,224	0.973

The preceding results indicate that salary increases were less than expected over this four-year period. However, it is our understanding that retroactive payroll increases have either been made or are planned in the future. Therefore, we recommend no change in the rates of salary increase at this time.



OTHER ASSUMPTIONS AND METHODS

ASSETS: Currently 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 one-seventh of the difference between market value and expected actuarial value. The actuarial value of assets is constrained to an 80% to 120% corridor around the market value of assets. In addition, there is an adjustment made for the effect of the adjustment pursuant to D.C. Code §1-907.02(c). We recommend no change to the current smoothing method.

PERCENT MARRIED: Currently 64% of active members are assumed to be married with the male three years older than his spouse. Active members are assumed to have one child age ten. Since the data we currently have does not include spousal information, we will recommend no change to this assumption at this time, but will review closely during the next experience study.

VALUATION COST METHOD: Currently the valuation uses the Aggregate Actuarial Cost Method. While there is no issue with that method, we would suggest seeking legislation to allow a change to the Entry Age Normal (EAN) cost method. The EAN cost method is the most widely used cost method of large public sector plans and has demonstrated the highest degree of contribution stability as compared to alternative methods. Actuarial gains and losses under EAN are reflected in the unfunded actuarial accrued liability.

WITHDRAWAL ASSUMPTION: It is assumed that 35% of the vested members who terminate elect to withdraw their contributions while the remaining 65% elect to leave their contributions in the plan in order to be eligible for a benefit at their retirement date. We recommend no change to this assumption, but will review this assumption more closely during the next experience study.



POLICE OFFICERS' RETIREMENT PLAN

RATES OF WITHDRAWAL

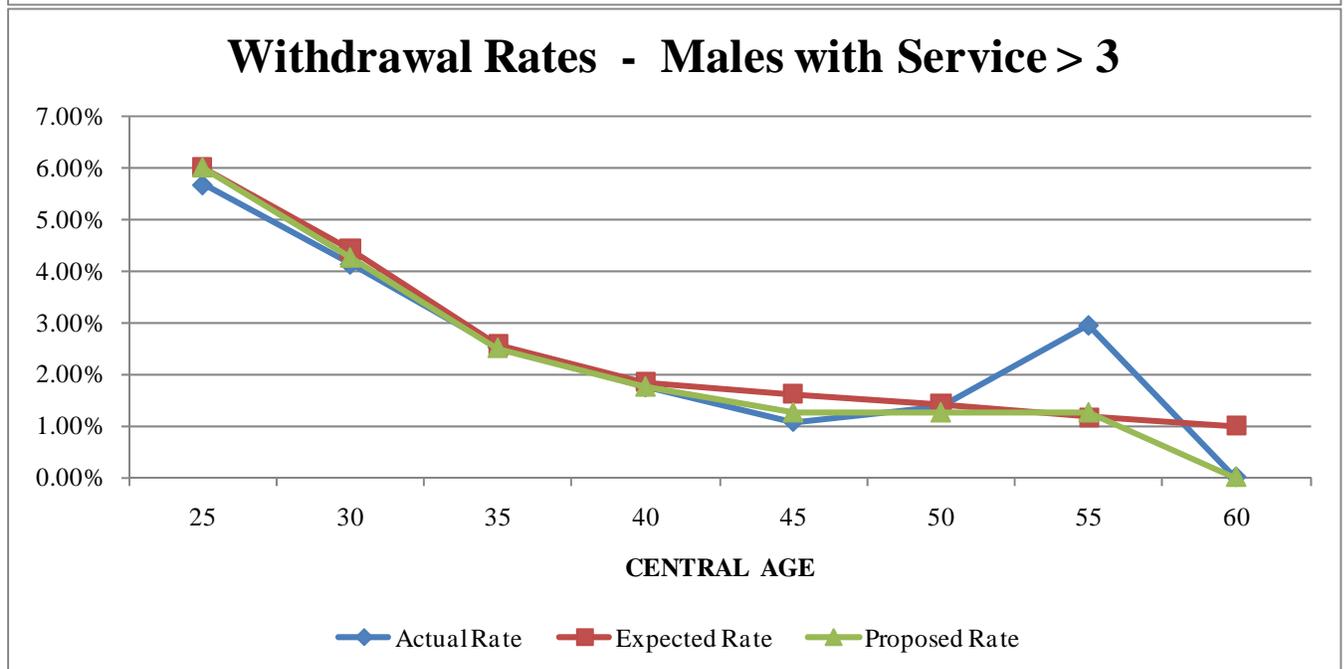
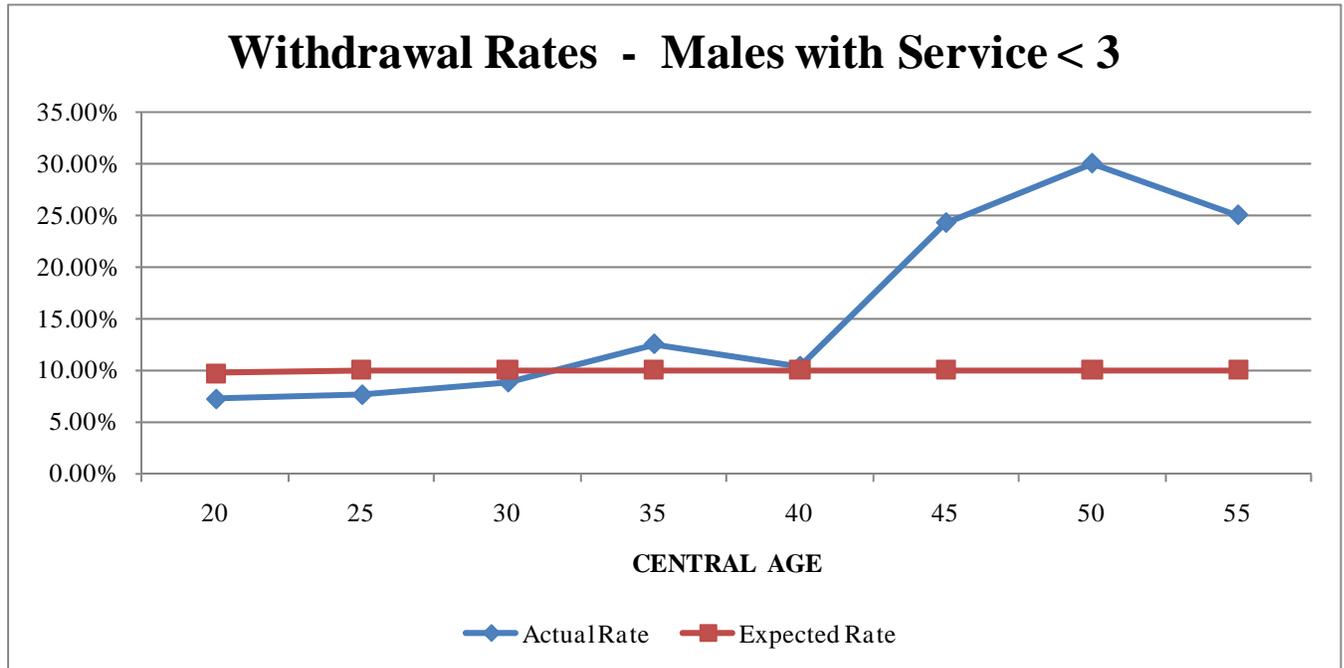
**COMPARISON OF ACTUAL AND EXPECTED WITHDRAWALS
FROM ACTIVE SERVICE**

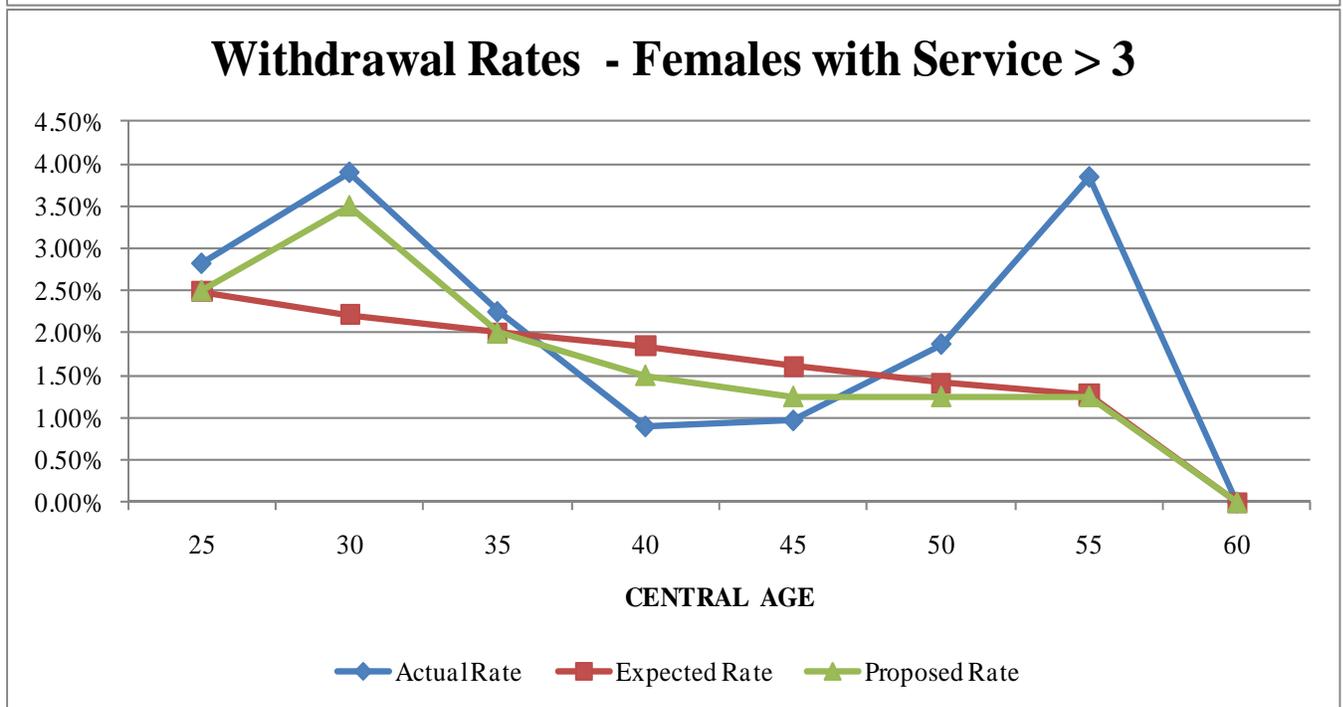
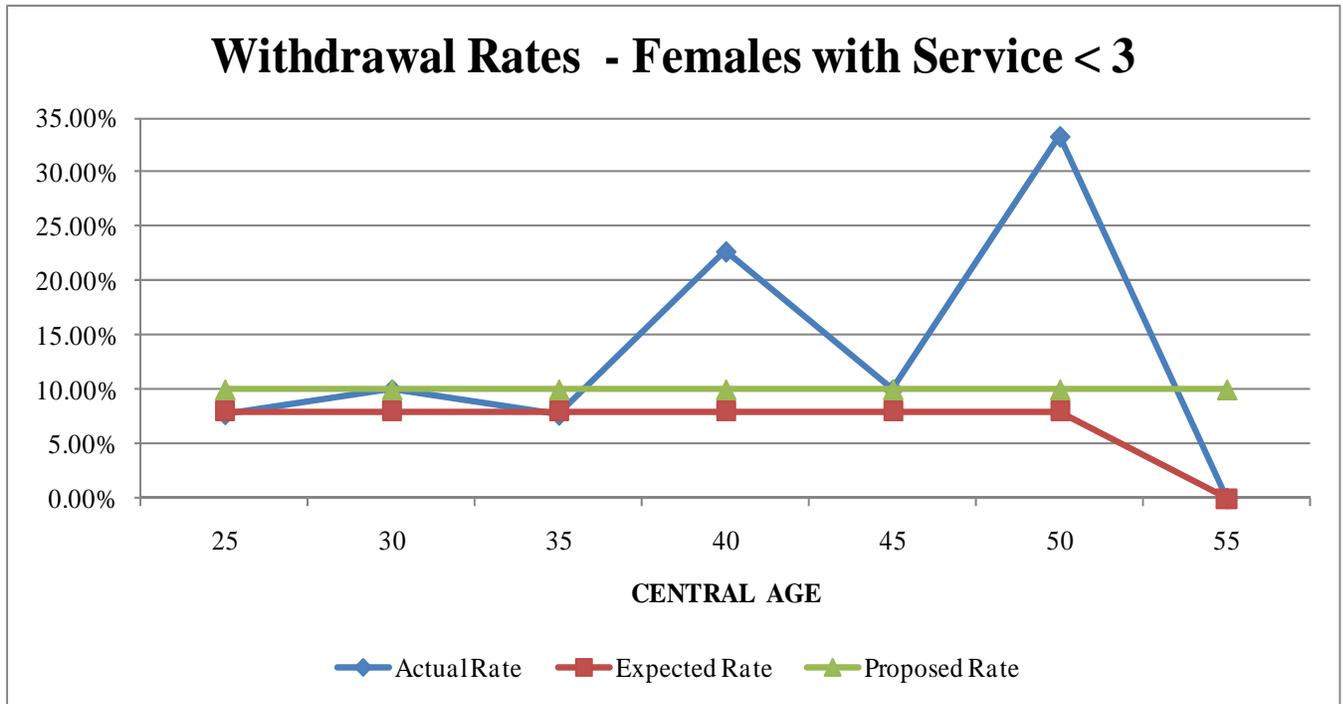
CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS					
	Withdrawals with less than three years of service					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
20	2	3	0.667	0	1	0.000
25	46	61	0.754	11	11	1.000
30	28	32	0.875	8	6	1.333
35	16	13	1.231	3	3	1.000
40	9	9	1.000	5	2	2.500
45	8	3	2.667	2	2	1.000
50	3	1	3.000	2	0	0.000
55	1	0	0.000	0	0	0.000
TOTAL	113	122	0.926	31	25	1.240
CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS					
	Withdrawals with three or more years of service					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
25	29	31	0.935	5	4	1.250
30	51	55	0.927	11	6	1.833
35	44	45	0.978	12	11	1.091
40	49	52	0.942	8	16	0.500
45	29	44	0.659	8	13	0.615
50	14	14	1.000	7	5	1.400
55	3	1	3.000	1	0	0.000
60	0	0	0.000	0	0	0.000
TOTAL	219	242	0.905	52	55	0.945

The following graph shows a comparison of the present, actual and proposed rates of withdrawal.



RATES OF WITHDRAWAL FOR ACTIVE MEMBERS





The rates of withdrawal adopted by the Board are used to determine the expected number of separations from active service which will occur as a result of resignation or dismissal. The preceding results indicate that the actual number of withdrawals is slightly less than expected for



males at both service breakdowns. In addition, the results indicate that the actual number of withdrawals for females is more than expected for less than three years of service and less than expected for three or more years of service. We recommend that the rates of withdrawal be revised to more closely reflect the experience of the system.

The following table shows a comparison between the present withdrawal rates and the proposed withdrawal rates for members.

COMPARATIVE RATES OF WITHDRAWAL

AGE	RATES OF WITHDRAWAL			
	Less than 3 years of service			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
25	10.0%	10.0%	8.0%	10.0%
30	10.0%	10.0%	8.0%	10.0%
35	10.0%	10.0%	8.0%	10.0%
40	10.0%	10.0%	8.0%	10.0%
45	10.0%	10.0%	8.0%	10.0%
50	10.0%	10.0%	8.0%	10.0%
55	10.0%	10.0%	8.0%	10.0%

AGE	RATES OF WITHDRAWAL			
	3 or more years of service			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
25	6.0%	6.0%	2.5%	2.5%
30	3.5%	4.3%	2.0%	3.5%
35	2.0%	2.5%	2.0%	2.0%
40	1.8%	1.8%	1.8%	1.5%
45	1.5%	1.3%	1.5%	1.3%
50	1.3%	1.3%	1.3%	1.3%
55	1.0%	1.3%	1.0%	1.3%



**COMPARISON OF ACTUAL AND EXPECTED WITHDRAWALS
FROM ACTIVE SERVICE BASED ON PROPOSED RATES**

CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS					
	Withdrawals with less than three years of service					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
20	2	3	0.667	0	1	0.000
25	46	61	0.754	11	14	0.786
30	28	32	0.875	8	8	1.000
35	16	13	1.231	3	4	0.750
40	9	9	1.000	5	2	2.500
45	8	3	2.667	2	2	1.000
50	3	1	3.000	2	1	2.000
55	1	0	0.000	0	0	0.000
TOTAL	113	122	0.926	31	32	0.969
CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS					
	Withdrawals with three or more years of service					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
25	29	29	1.000	5	5	1.000
30	51	52	0.981	11	9	1.222
35	44	45	0.978	12	11	1.091
40	49	50	0.980	8	14	0.571
45	29	36	0.806	8	11	0.727
50	14	13	1.077	7	5	1.400
55	3	1	3.000	1	0	0.000
60	0	0	0.000	0	0	0.000
TOTAL	219	226	0.969	52	55	0.945



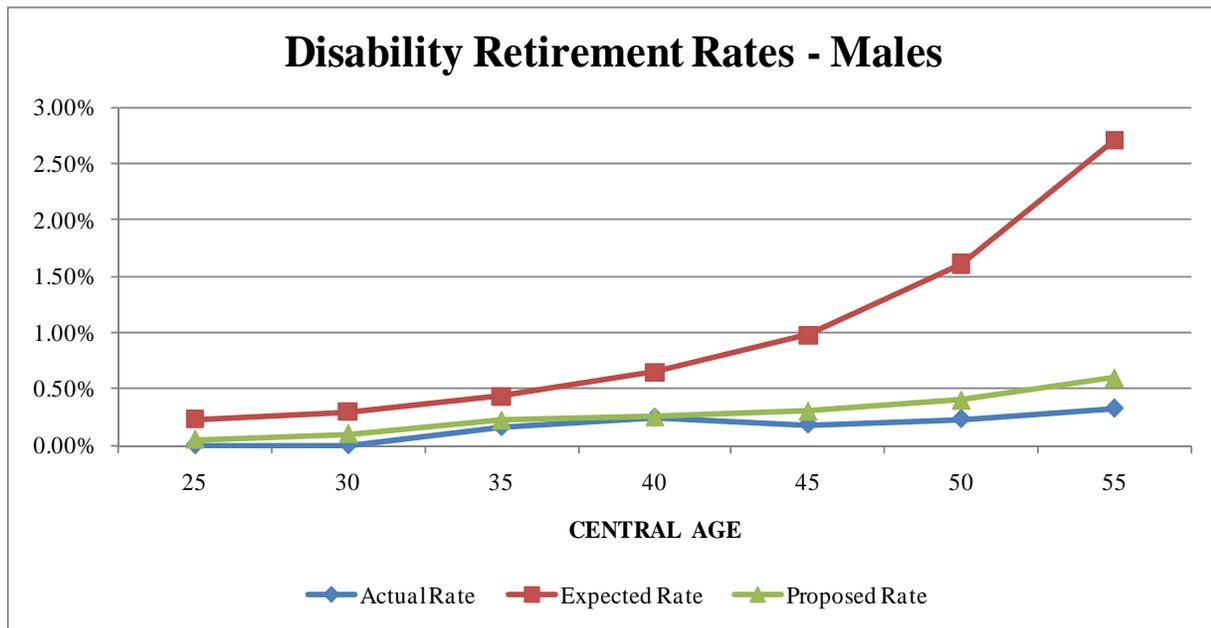
POLICE OFFICERS' RETIREMENT PLAN

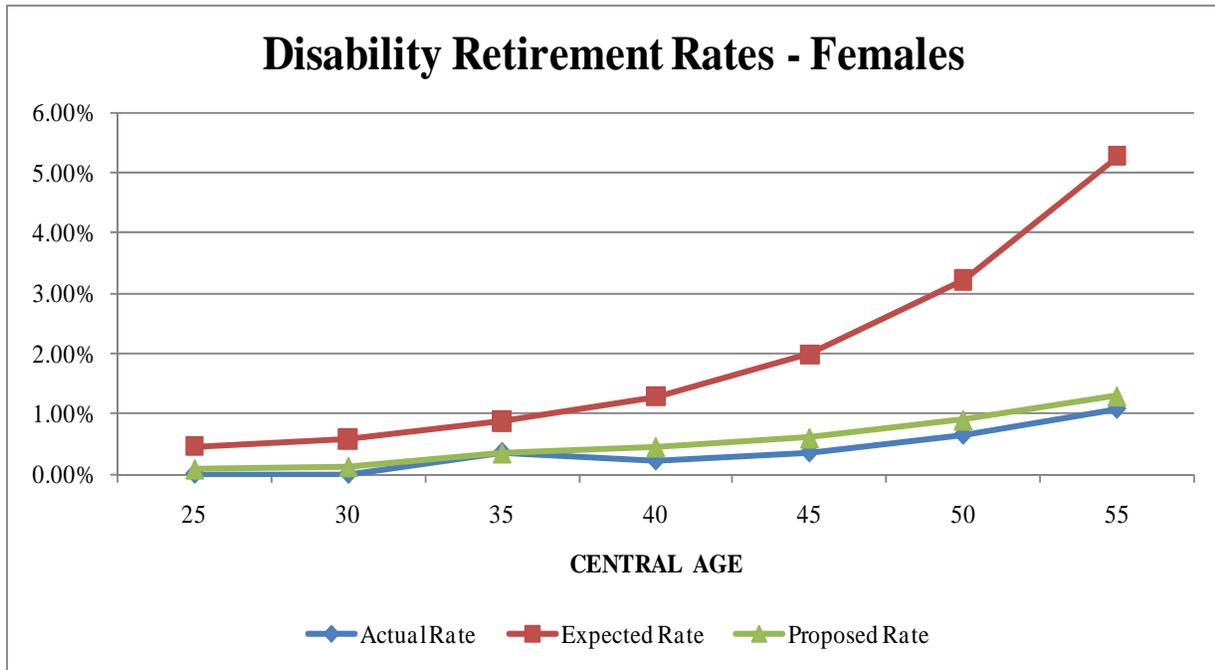
RATES OF DISABILITY RETIREMENT

COMPARISON OF ACTUAL AND EXPECTED DISABILITY RETIREMENTS

CENTRAL AGE OF GROUP	NUMBER OF DISABILITY RETIREMENTS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
35	3	8	0.375	2	5	0.400
40	7	19	0.368	2	12	0.167
45	5	27	0.185	3	17	0.176
50	3	21	0.143	3	15	0.200
55	1	8	0.125	1	5	0.200
60	2	1	2.000	0	0	0.000
TOTAL	21	84	0.250	11	54	0.204

The following graphs show a comparison of the present, actual, and proposed rates of disability retirements.





During the period under investigation, the actual rates of disability retirement were significantly less than expected over all age groups. Therefore, we recommend the rates of disability retirement be revised to more closely reflect the experience of the System.

The following table shows a comparison between the present disability retirement rates and the proposed rates.

COMPARATIVE RATES OF DISABILITY RETIREMENT

AGE	RATES OF DISABILITY RETIREMENT			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
25	0.22%	0.05%	0.44%	0.08%
30	0.29%	0.10%	0.58%	0.12%
35	0.43%	0.22%	0.85%	0.35%
40	0.63%	0.25%	1.25%	0.45%
45	0.98%	0.30%	1.96%	0.60%
50	1.63%	0.40%	3.25%	0.90%
55	2.89%	0.60%	5.78%	1.30%
60	4.13%	0.80%	8.25%	1.70%



**COMPARISON OF ACTUAL AND EXPECTED DISABILITY RETIREMENTS
BASED ON PROPOSED RATES**

CENTRAL AGE OF GROUP	NUMBER OF DISABILITY RETIREMENTS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
35	3	4	0.750	2	2	1.000
40	7	7	1.000	2	4	0.500
45	5	8	0.625	3	5	0.600
50	3	5	0.600	3	4	0.750
55	1	2	0.500	1	1	1.000
60	2	1	2.000	0	0	0.000
TOTAL	21	27	0.778	11	16	0.688



POLICE OFFICERS' RETIREMENT PLAN

RATES OF SERVICE RETIREMENT

COMPARISON OF ACTUAL AND EXPECTED RETIREMENTS

AGE	NUMBER OF SERVICE RETIREMENTS		
	Actual	Expected	Ratio of Actual to Expected
50	57	31	1.839
51	29	25	1.160
52	24	24	1.000
53	21	20	1.050
54	26	18	1.444
55	23	12	1.917
56	9	7	1.286
57	5	5	1.000
58	8	5	1.600
59	5	3	1.667
SUBTOTAL	207	150	1.380
60	2	17	0.118
61	3	16	0.188
62	5	14	0.357
63	0	9	0.000
64	1	8	0.125
65	1	19	0.053
TOTAL	219	233	0.940

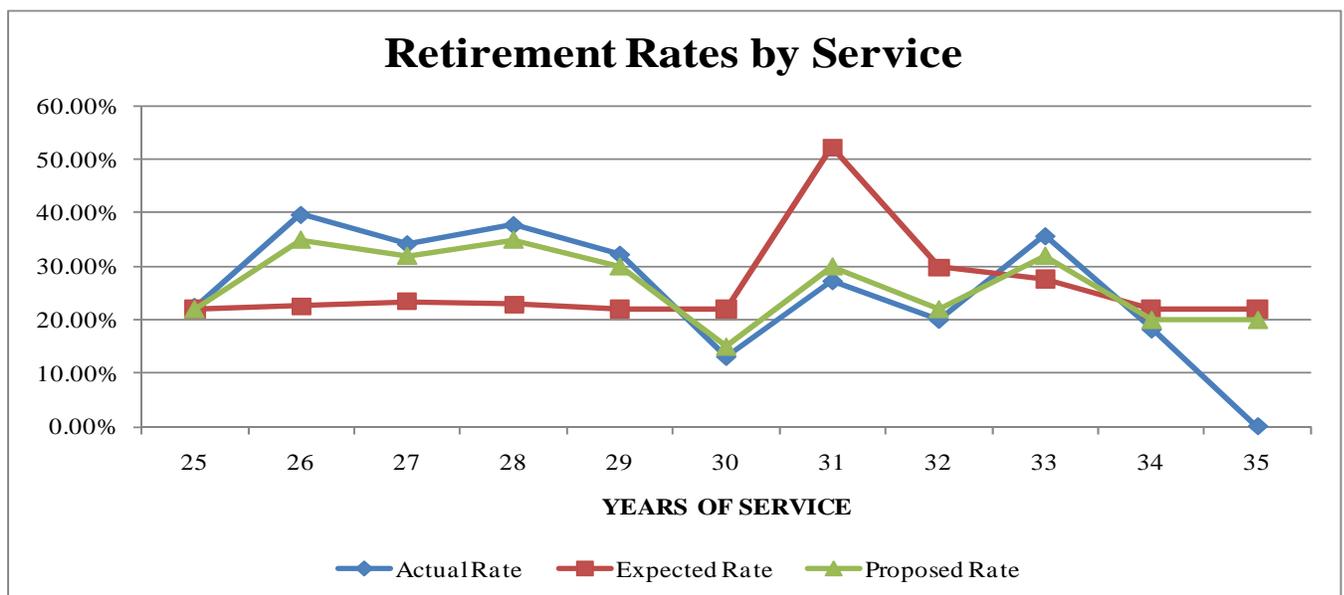
The current rates of service retirement for the Police Officers' Retirement Plan are based on age and the current rates of service retirement for the Fire Fighters' Retirement Plan are based on service. We feel since these are both Public Safety Plans, both should be based on the same criteria. Therefore, we are recommending that the rates of service retirement for this Plan be changed to be based on service. The following chart shows the comparison of actual and expected retirements based on service.



SERVICE	NUMBER OF SERVICE RETIREMENTS		
	Actual	Expected	Ratio of Actual to Expected
Under 25	9	4	2.250
25	35	34	1.029
26	60	34	1.765
27	39	27	1.444
28	31	19	1.632
29	10	7	1.429
30	3	5	0.600
31	6	12	0.500
32	4	6	0.667
33	5	4	1.250
34	2	2	1.000
35	0	2	0.000
36	3	4	0.750
37	3	12	0.250
38	3	16	0.188
39	3	16	0.188
40 and Over	3	29	0.103
TOTAL	219	233	0.940

The following graphs show a comparison of the present and actual rates of service retirements.

RATES OF RETIREMENT FOR ACTIVE MEMBERS





The preceding results indicate that overall, the actual number of retirements was slightly less than expected. Therefore, we recommend revising the rate of retirement to match the experience more closely.

The following table shows a comparison between the present retirement rates and the proposed rates.

COMPARATIVE RATES OF SERVICE RETIREMENT

RATES OF SERVICE RETIREMENT			
AGE	Present*	SERVICE	Proposed**
50	22.0%	Under 25	12.5%
51	22.0%	25	22.0%
52	22.0%	26	35.0%
53	22.0%	27	32.0%
54	22.0%	28	35.0%
55	22.0%	29	30.0%
56	22.0%	30	15.0%
57	22.0%	31	30.0%
58	22.0%	32	22.0%
59	22.0%	33	32.0%
60	100.0%	34	20.0%
61	100.0%	35	20.0%
62	100.0%	36	20.0%
63	100.0%	37	20.0%
64	100.0%	38	20.0%
65	100.0%	39	20.0%
		40 and Over	20.0%

*All ages have assumed rate of 50% at 31 years of service.

** 100% assumed rate at age 65.



**COMPARISON OF ACTUAL AND EXPECTED SERVICE RETIREMENTS
BASED ON PROPOSED RATES**

SERVICE	NUMBER OF SERVICE RETIREMENTS		
	Actual	Expected	Ratio of Actual to Expected
Under 25	9	1	9.000
25	35	34	1.029
26	60	53	1.132
27	39	36	1.083
28	31	29	1.069
29	10	9	1.111
30	3	3	1.000
31	6	7	0.857
32	4	4	1.000
33	5	4	1.250
34	2	2	1.000
35	0	2	0.000
36	3	2	1.500
37	3	5	0.600
38	3	6	0.500
39	3	5	0.600
40 and Over	3	18	0.167
TOTAL	219	220	0.995



POLICE OFFICERS' RETIREMENT PLAN

RATES OF MORTALITY

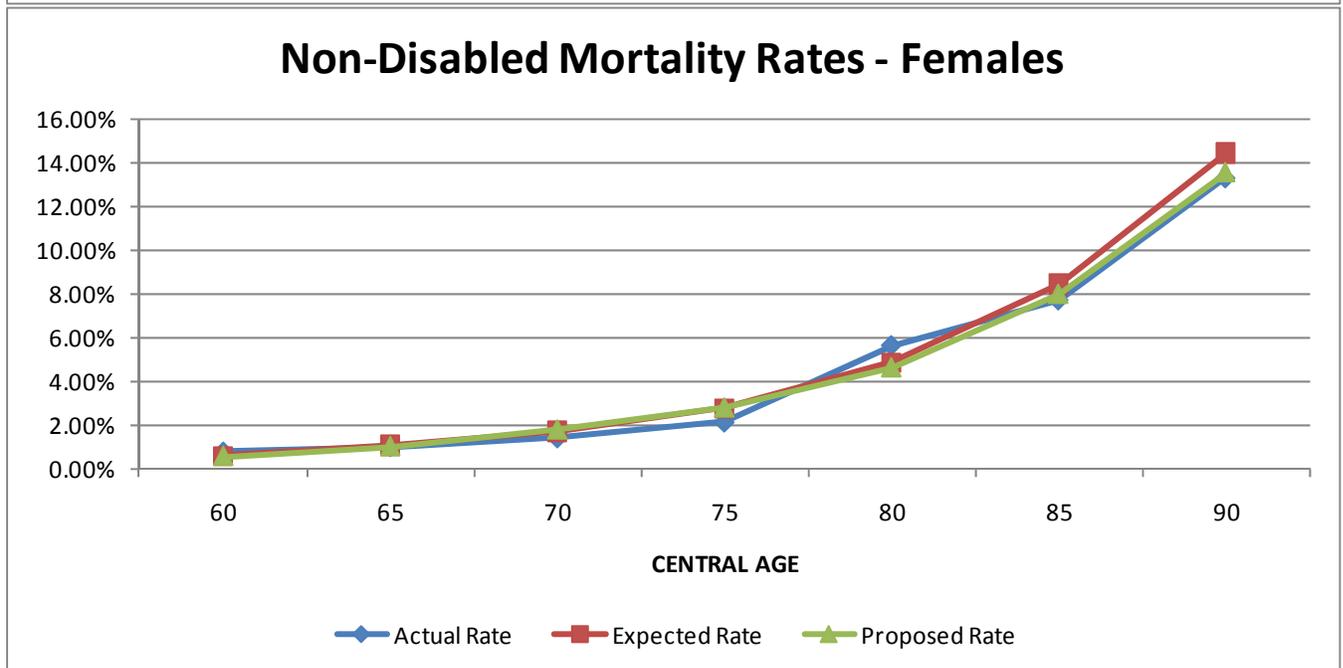
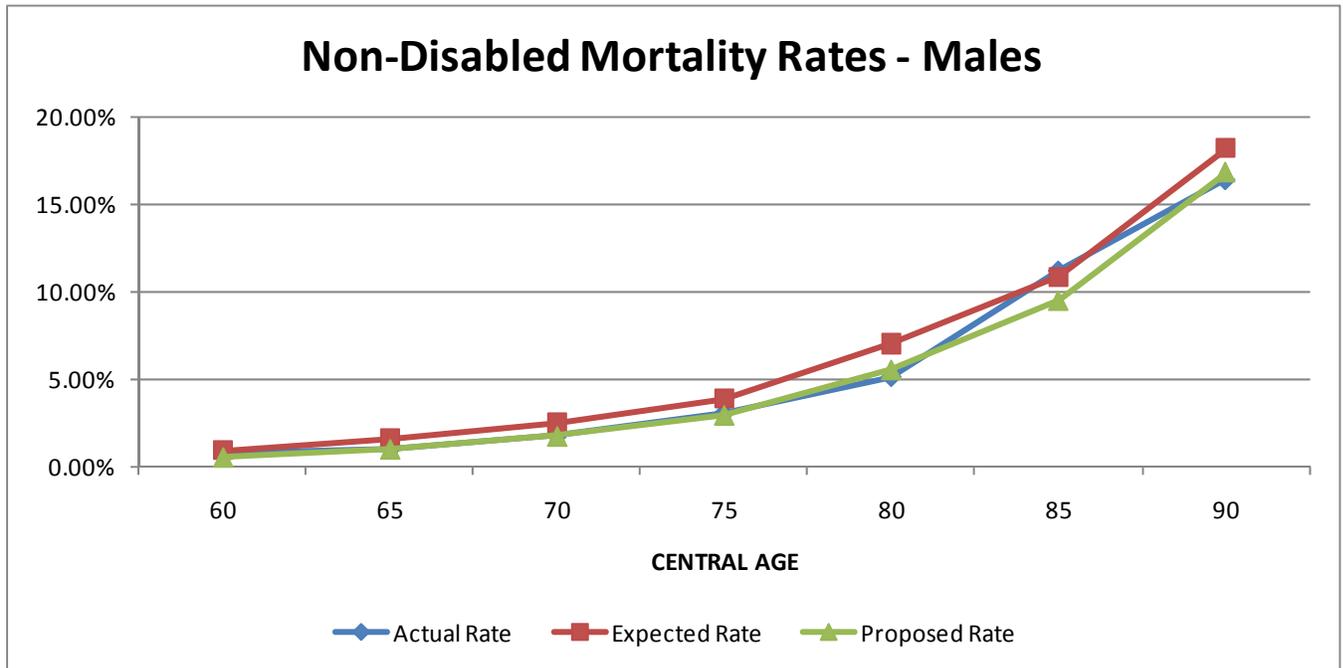
**COMPARISON OF ACTUAL AND EXPECTED CASES OF
POST-RETIREMENT DEATHS**

CENTRAL AGE OF GROUP	NUMBER OF POST-RETIREMENT DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
	SERVICE RETIREMENTS AND BENEFICIARIES					
52 and Under	0	1	0.000	1	0	0.000
55	10	9	1.111	9	2	4.500
60	28	35	0.800	6	5	1.200
65	27	43	0.628	6	6	1.000
70	30	42	0.714	8	10	0.800
75	24	30	0.800	11	14	0.786
80	21	29	0.724	30	26	1.154
85	15	15	1.000	36	39	0.923
90	10	11	0.909	48	52	0.923
95	4	5	0.800	30	33	0.909
98 & over	3	2	1.500	8	7	1.143
TOTAL	172	222	0.775	193	194	0.995
DISABILITY RETIREMENTS						
47 and Under	4	3	1.333	1	2	0.500
50	2	2	1.000	0	1	0.000
55	4	4	1.000	0	1	0.000
60	16	9	1.778	1	1	1.000
65	15	13	1.154	0	1	0.000
70	8	15	0.533	0	0	0.000
75	29	20	1.450	0	0	0.000
80	29	36	0.806	2	0	0.000
85	29	35	0.829	1	0	0.000
88 & over	34	43	0.791	0	0	0.000
TOTAL	170	180	0.944	5	6	0.833



The following graphs show a comparison of the present, actual and, for disability retirements, proposed rates of post-retirement deaths.

**POST-RETIREMENT DEATHS
SERVICE RETIREMENTS AND BENEFICIARIES
OF DECEASED MEMBERS**



The preceding results indicate that the actual number of post-retirement deaths of service retirements for males and females was less than expected. For disability retirements, the actual mortality rates were also less than expected for males and females overall.



We recommend that the rates of mortality after service retirement and for dependents of deceased pensioners be revised to the RP-2000 Combined Mortality Table projected with Scale AA to 2015 with females set forward 1 year. In addition, we recommend that the rates of mortality for disability retirements be revised to more closely match the experience.

The following table shows a comparison between the present and proposed rates of mortality.

COMPARATIVE RATES OF POST-RETIREMENT SERVICE RETIREMENTS AND BENEFICIARIES OF DECEASED MEMBERS

AGE	RATES OF POST-RETIREMENT DEATH			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
	SERVICE RETIREMENTS AND BENEFICIARIES			
35	0.0915%	0.0717%	0.0514%	0.0435%
40	0.1153%	0.0957%	0.0763%	0.0617%
45	0.1697%	0.1239%	0.1046%	0.0960%
50	0.2773%	0.1628%	0.1536%	0.1432%
55	0.4758%	0.2718%	0.2466%	0.2739%
60	0.8576%	0.5297%	0.4773%	0.5393%
65	1.5629%	1.0309%	0.9286%	1.0161%
70	2.5516%	1.7702%	1.4763%	1.7233%
75	4.0012%	3.0622%	2.4393%	2.7451%
80	6.6696%	5.5360%	4.2361%	4.5702%
85	10.4559%	9.9680%	7.2836%	7.8920%
90	16.4442%	17.2706%	12.5016%	13.8232%
AGE	RATES OF POST-RETIREMENT DEATH			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
	DISABILITY RETIREMENTS			
35	2.7800%	0.8039%	2.1400%	0.4998%
40	2.8200%	0.8039%	2.0900%	0.4998%
45	3.2200%	0.8039%	2.2400%	0.4998%
50	3.8300%	0.8039%	2.5700%	0.4998%
55	4.8200%	0.8039%	2.9500%	0.4998%
60	6.0300%	1.1596%	3.3100%	0.7396%
65	6.7800%	1.7548%	3.7000%	1.1449%
70	7.3900%	2.3500%	4.1100%	1.5501%
75	8.4200%	4.0664%	4.9200%	2.6567%
80	11.2800%	5.7827%	7.4600%	3.7631%
85	16.8200%	9.8690%	11.2800%	7.3162%
90	25.2500%	13.9553%	16.8200%	10.8694%

The following shows a comparison of the actual and expected post-retirement deaths based on new revised rates of mortality.



**COMPARISON OF ACTUAL AND EXPECTED CASES OF
POST-RETIREMENT DEATHS BASED ON REVISED MORTALITY RATES**

CENTRAL AGE OF GROUP	NUMBER OF POST-RETIREMENT DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
	SERVICE RETIREMENTS AND BENEFICIARIES					
52 and Under	0	1	0.000	1	0	0.000
55	10	5	2.000	9	2	4.500
60	28	21	1.333	6	4	1.500
65	27	28	0.964	6	6	1.000
70	30	30	1.000	8	10	0.800
75	24	23	1.043	11	14	0.786
80	21	23	0.913	30	25	1.200
85	15	13	1.154	36	37	0.973
90	10	10	1.000	48	49	0.980
95	4	5	0.800	30	29	1.034
98 & over	3	2	1.500	8	5	1.600
TOTAL	172	161	1.068	193	181	1.066
DISABILITY RETIREMENTS						
47 and Under	4	3	1.333	1	1	1.000
50	2	2	1.000	0	1	0.000
55	4	3	1.333	0	1	0.000
60	16	8	2.000	1	1	1.000
65	15	11	1.364	0	1	0.000
70	8	14	0.571	0	0	0.000
75	29	18	1.611	0	0	0.000
80	29	32	0.906	2	0	0.000
85	29	31	0.935	1	0	0.000
88 & over	34	39	0.872	0	0	0.000
TOTAL	170	161	1.056	5	5	1.000



POLICE OFFICERS' RETIREMENT PLAN

RATES OF SALARY INCREASE

**COMPARISON OF ACTUAL AND EXPECTED SALARIES
OF ACTIVE MEMBERS**

SERVICE OF GROUP	SALARIES AT END OF YEAR (1000's)		
	MALES AND FEMALES		
	Actual	Expected	Ratio of Actual to Expected
0	33,517	34,252	0.979
1	40,808	40,588	1.005
2	43,856	45,213	0.970
3	39,475	41,670	0.947
4	38,354	39,642	0.968
5 - 9	176,285	182,630	0.965
10 - 14	109,506	113,290	0.967
15 - 19	361,624	371,413	0.974
20 - 24	170,891	178,209	0.959
25 - 29	40,792	42,274	0.965
30 +	12,837	13,137	0.977
TOTAL	1,067,945	1,102,318	0.969

The preceding results indicate that salary increases were significantly less than expected over this four-year period. However, it is our understanding that future rates of salary increase are assumed to match current assumptions. Therefore, we recommend no change in the rates of salary increase at this time.



OTHER ASSUMPTIONS AND METHODS

ASSETS: Currently 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 one-seventh of the difference between market value and expected actuarial value. The actuarial value of assets is constrained to an 80% to 120% corridor around the market value of assets. In addition, there is an adjustment made for the effect of the adjustment pursuant to D.C. Code §1-907.02(c). We recommend maintaining the current smoothing method.

PERCENT MARRIED: Currently 80% of active members are assumed to be married with the male three years older than his spouse. Active members are assumed to have one child age ten. Since the data we currently have does not include spousal information, we will recommend no change to this assumption at this time, but will review closely during the next experience study.

VALUATION COST METHOD: Currently the valuation uses the Aggregate Actuarial Cost Method. While there is no issue with that method, we would suggest seeking legislation to allow a change to the Entry Age Normal (EAN) cost method. The EAN cost method is the most widely used cost method of large public sector plans and has demonstrated the highest degree of contribution stability as compared to alternative methods. Actuarial gains and losses under EAN are reflected in the unfunded actuarial accrued liability.

WITHDRAWAL ASSUMPTION: It is assumed that 80% of the vested members who terminate elect to withdraw their contributions while the remaining 20% elect to leave their contributions in the plan in order to be eligible for a benefit at their retirement date. We recommend no change to this assumption, but will review this assumption more closely during the next experience study.

PRE-RETIREMENT DEATH BENEFITS: To value the pre-retirement death benefit, the benefit form for all retirements (normal or disabled) is assumed to be a 67.8% Joint and Survivor annuity for all participants (based on 40% of average pay survivor benefits). One-fourth of all active deaths are assumed to occur in the line of duty. We recommend maintaining this assumption.

PERCENT OF DISABILITY: Three-fourths of all disabilities are assumed to occur in the line of duty. For all disability retirements occurring in the line of duty, the percent of disability is assumed to be 100%. We recommend no change to these assumptions.



FIREFIGHTERS' RETIREMENT PLAN

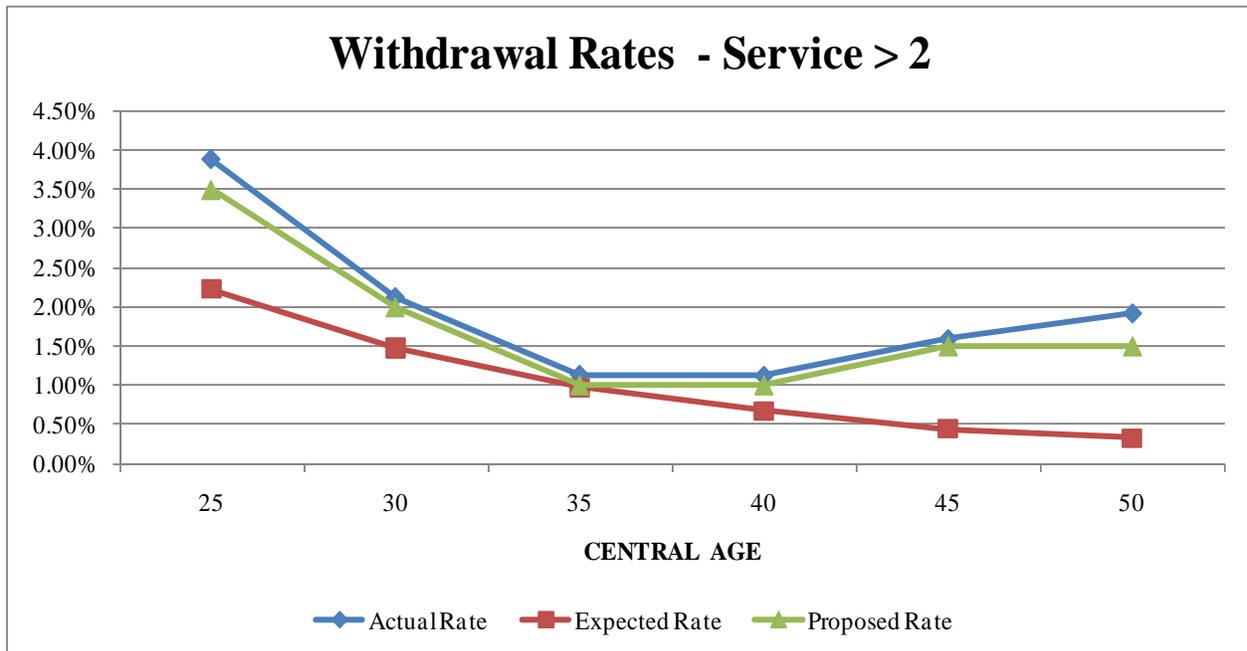
RATES OF WITHDRAWAL

**COMPARISON OF ACTUAL AND EXPECTED WITHDRAWALS
FROM ACTIVE SERVICE**

CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS					
	Less than 2 years service			2 or more years service		
	Actual	Expected	Ratio of Actual to	Actual	Expected	Ratio of Actual to
20	7	7	1.000	4	3	1.333
25	19	18	1.056	29	17	1.706
30	8	9	0.889	19	13	1.462
35	1	1	1.000	12	10	1.200
40	0	0	0.000	14	8	1.750
45	0	0	0.000	17	5	3.400
50	0	0	0.000	11	2	5.500
55	0	0	0.000	1	0	0.000
TOTAL	35	35	1.000	107	58	1.845

The following graph shows a comparison of the present, actual and proposed rates of withdrawal.

RATES OF WITHDRAWAL FOR ACTIVE MEMBERS





The rates of withdrawal adopted by the Board are used to determine the expected number of separations from active service which will occur as a result of resignation or dismissal. The preceding results indicate that the actual number of withdrawals for members with less than 2 years of service is matching very closely. However, for members with more than 2 years of service, the actual number of withdrawals is significantly more than expected. Therefore, we recommend that the rates of withdrawal be revised to more closely reflect the experience of the system.

The following table shows a comparison between the present withdrawal rates and the proposed withdrawal rates for members with five or more years of service.

COMPARATIVE RATES OF WITHDRAWAL

AGE	RATES OF WITHDRAWAL			
	Less than 2 years service		2 or more years service	
	Present	Proposed	Present	Proposed
25	9.0%	9.0%	1.9%	3.5%
30	9.0%	9.0%	1.2%	2.0%
35	9.0%	9.0%	0.8%	1.0%
40	9.0%	9.0%	0.6%	1.0%
45	9.0%	9.0%	0.4%	1.5%
50	9.0%	9.0%	0.3%	1.5%
55	9.0%	9.0%	0.0%	0.0%

COMPARISON OF ACTUAL AND EXPECTED WITHDRAWALS FROM ACTIVE SERVICE BASED ON PROPOSED RATES

CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS					
	Less than 2 years service			2 or more years service		
	Actual	Expected	Ratio of Actual to	Actual	Expected	Ratio of Actual to
20	7	7	1.000	4	4	1.000
25	19	18	1.056	29	25	1.160
30	8	9	0.889	19	18	1.056
35	1	1	1.000	12	12	1.000
40	0	0	0.000	14	13	1.077
45	0	0	0.000	17	15	1.133
50	0	0	0.000	11	8	1.375
55	0	0	0.000	1	0	0.000
TOTAL	35	35	1.000	107	95	1.126



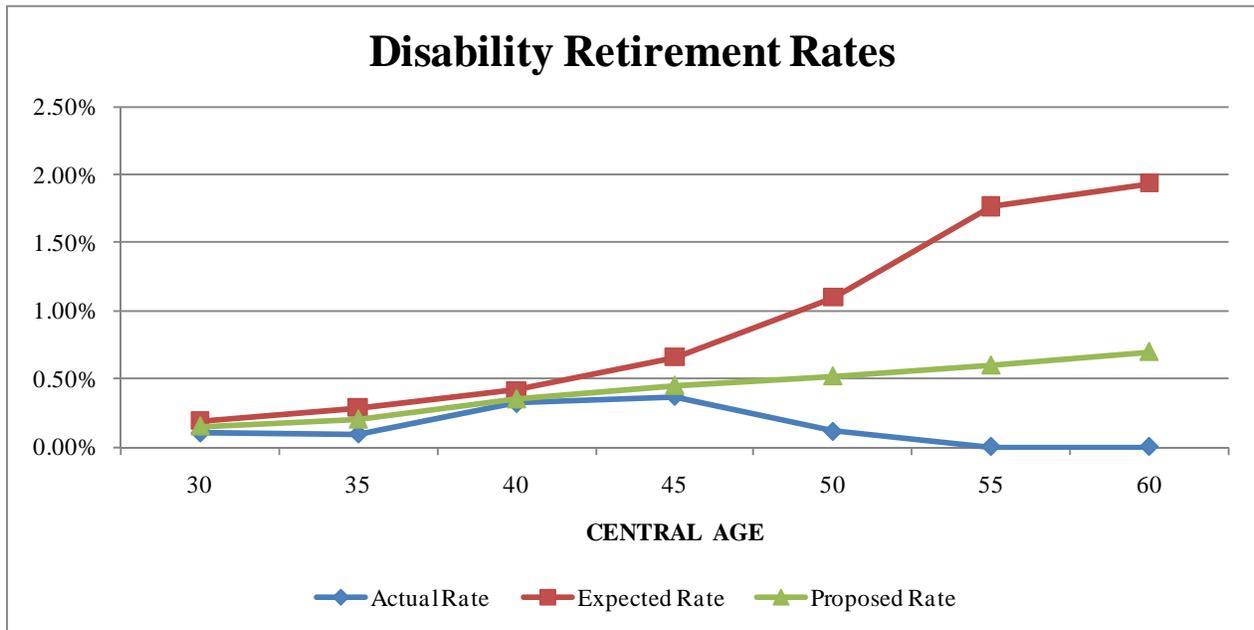
FIREFIGHTERS' RETIREMENT PLAN

RATES OF DISABILITY RETIREMENT

COMPARISON OF ACTUAL AND EXPECTED DISABILITY RETIREMENTS

CENTRAL AGE OF GROUP	NUMBER OF DISABILITY RETIREMENTS		
	Actual	Expected	Ratio of Actual to
30	1	2	0.500
35	1	3	0.333
40	4	5	0.800
45	4	7	0.571
50	1	10	0.100
55	0	5	0.000
60	0	1	0.000
TOTAL	11	33	0.333

The following graphs show a comparison of the present, actual, and proposed rates of disability retirements.



During the period under investigation, the actual rates of disability retirement were less than expected over all age groups. Therefore, we recommend the rates of disability retirement be revised to more closely reflect the experience of the System.



The following table shows a comparison between the present disability retirement rates and the proposed rates.

COMPARATIVE RATES OF DISABILITY RETIREMENT

AGE	RATES OF DISABILITY RETIREMENT	
	Present	Proposed
25	0.14%	0.02%
30	0.19%	0.15%
35	0.28%	0.20%
40	0.41%	0.35%
45	0.65%	0.45%
50	1.07%	0.52%
55	1.91%	0.60%
60	2.72%	0.70%

COMPARISON OF ACTUAL AND EXPECTED DISABILITY RETIREMENTS BASED ON PROPOSED RATES

CENTRAL AGE OF GROUP	NUMBER OF DISABILITY RETIREMENTS		
	Actual	Expected	Ratio of Actual to
30	1	1	1.000
35	1	2	0.500
40	4	4	1.000
45	4	5	0.800
50	1	5	0.200
55	0	2	0.000
60	0	0	0.000
TOTAL	11	19	0.579



FIREFIGHTERS' RETIREMENT PLAN

RATES OF SERVICE RETIREMENT

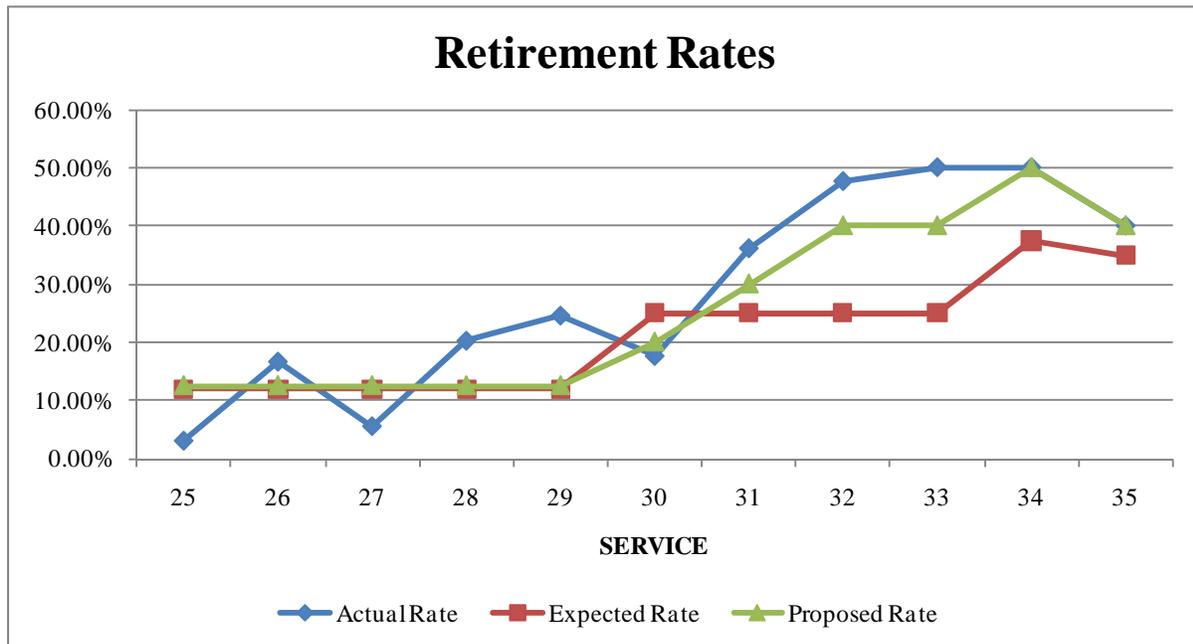
COMPARISON OF ACTUAL AND EXPECTED RETIREMENTS

YEARS OF SERVICE	NUMBER OF SERVICE RETIREMENTS		
	Actual	Expected	Ratio of Actual to
Under 25	2	3	0.667
25	3	12	0.250
26	16	12	1.333
27	5	11	0.455
28	16	9	1.778
29	14	7	2.000
30	9	13	0.692
31	13	9	1.444
32	10	5	2.000
33	6	3	2.000
34	3	2	1.500
35	2	2	1.000
36	2	3	0.667
37	2	4	0.500
38	2	3	0.667
39	1	1	1.000
40 & Over	1	1	1.000
TOTAL	107	100	1.070

The following graphs show a comparison of the present and actual rates of service retirements.



RATES OF RETIREMENT FOR ACTIVE MEMBERS



The preceding results indicate that the actual number of retirements during this period of investigation is slightly more than expected. Therefore, we recommend adjusting the rates of retirement to more closely match the experience of the Plan.

The following table shows a comparison between the present retirement rates and the proposed rates.

COMPARATIVE RATES OF SERVICE RETIREMENT

Years of Service	RATES OF SERVICE RETIREMENT*	
	Present	Proposed
25	12.0%	12.5%
26	12.0%	12.5%
27	12.0%	12.5%
28	12.0%	12.5%
29	12.0%	12.5%
30	25.0%	20.0%
31	25.0%	30.0%
32	25.0%	40.0%
33	25.0%	40.0%
34	25.0%	40.0%
35	35.0%	40.0%

*100% assumed rate at age 60



**COMPARISON OF ACTUAL AND EXPECTED SERVICE RETIREMENTS
BASED ON PROPOSED RATES**

YEARS OF SERVICE	NUMBER OF SERVICE RETIREMENTS		
	Actual	Expected	Ratio of Actual to
Under 25	2	3	0.667
25	3	12	0.250
26	16	12	1.333
27	5	11	0.455
28	16	10	1.600
29	14	7	2.000
30	9	10	0.900
31	13	11	1.182
32	10	8	1.250
33	6	5	1.200
34	3	3	1.000
35	2	2	1.000
36	2	3	0.667
37	2	4	0.500
38	2	3	0.667
39	1	1	1.000
40 & Over	1	1	1.000
TOTAL	107	106	1.009



FIREFIGHTERS' RETIREMENT PLAN

RATES OF MORTALITY

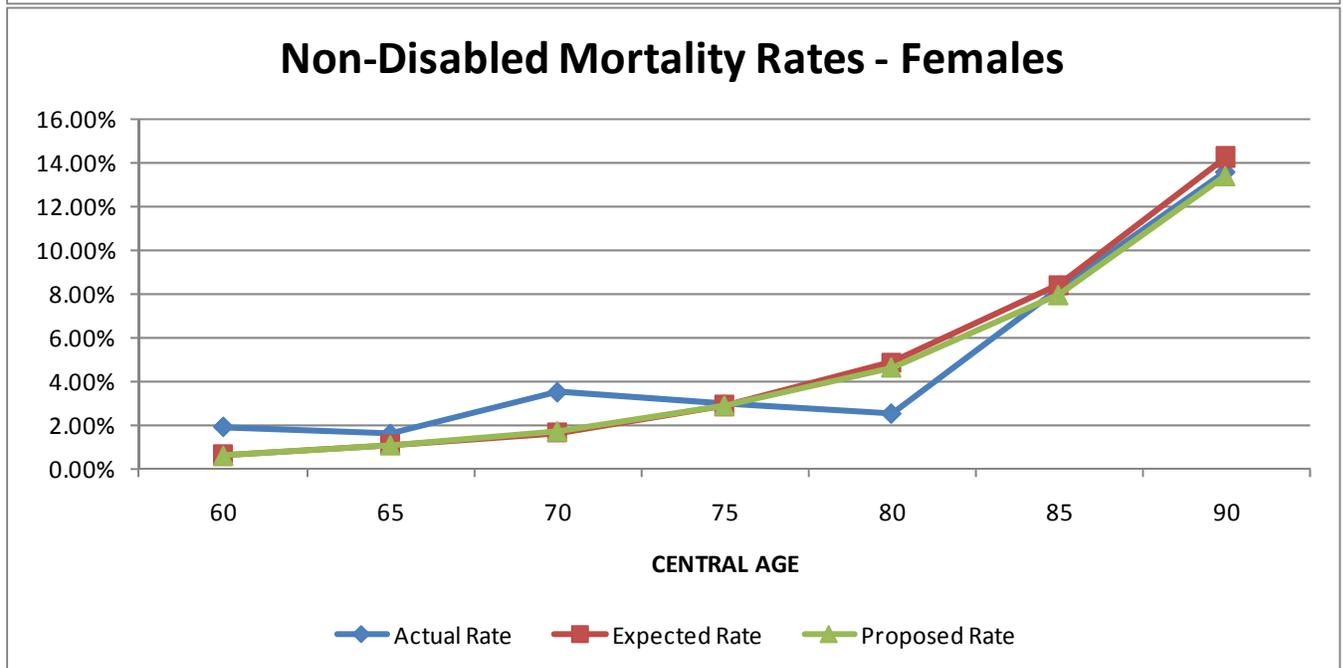
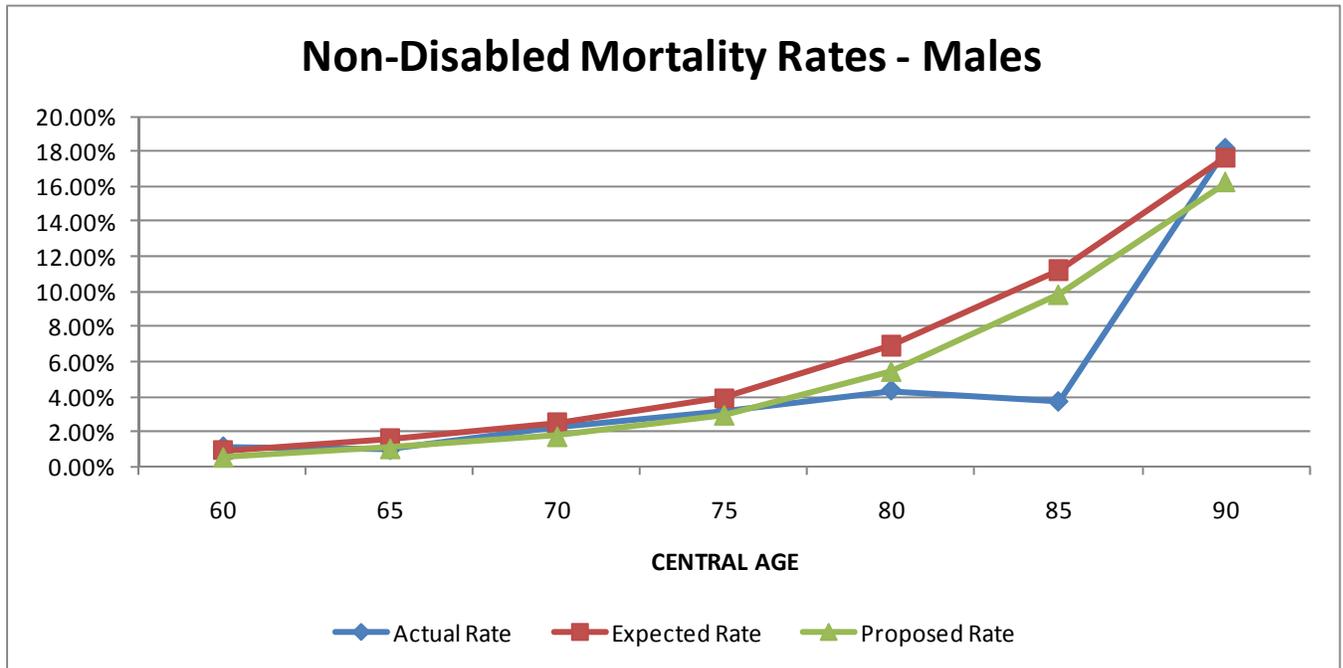
**COMPARISON OF ACTUAL AND EXPECTED CASES OF
POST-RETIREMENT DEATHS**

CENTRAL AGE OF GROUP	NUMBER OF POST-RETIREMENT DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to	Actual	Expected	Ratio of Actual to
	SERVICE RETIREMENTS AND BENEFICIARIES					
52 and Under	1	0	0.000	3	0	0.000
55	4	2	2.000	1	0	0.000
60	8	7	1.143	2	1	2.000
65	9	15	0.600	3	2	1.500
70	18	20	0.900	8	4	2.000
75	13	16	0.813	6	6	1.000
80	10	16	0.625	8	15	0.533
85	3	9	0.333	21	21	1.000
90	6	6	1.000	25	26	0.962
95	0	1	0.000	7	11	0.636
98 & over	1	0	0.000	4	6	0.667
TOTAL	73	92	0.793	88	92	0.957
	DISABILITY RETIREMENTS					
47 and Under	0	0	0.000	0	0	0.000
50	0	1	0.000	1	0	0.000
55	0	2	0.000	0	0	0.000
60	3	3	1.000	0	0	0.000
65	3	6	0.500	0	0	0.000
70	7	9	0.778	0	0	0.000
75	7	10	0.700	0	0	0.000
80	11	15	0.733	0	0	0.000
85	13	21	0.619	0	0	0.000
88 & over	26	33	0.788	0	0	0.000
TOTAL	70	100	0.700	1	0	0.000

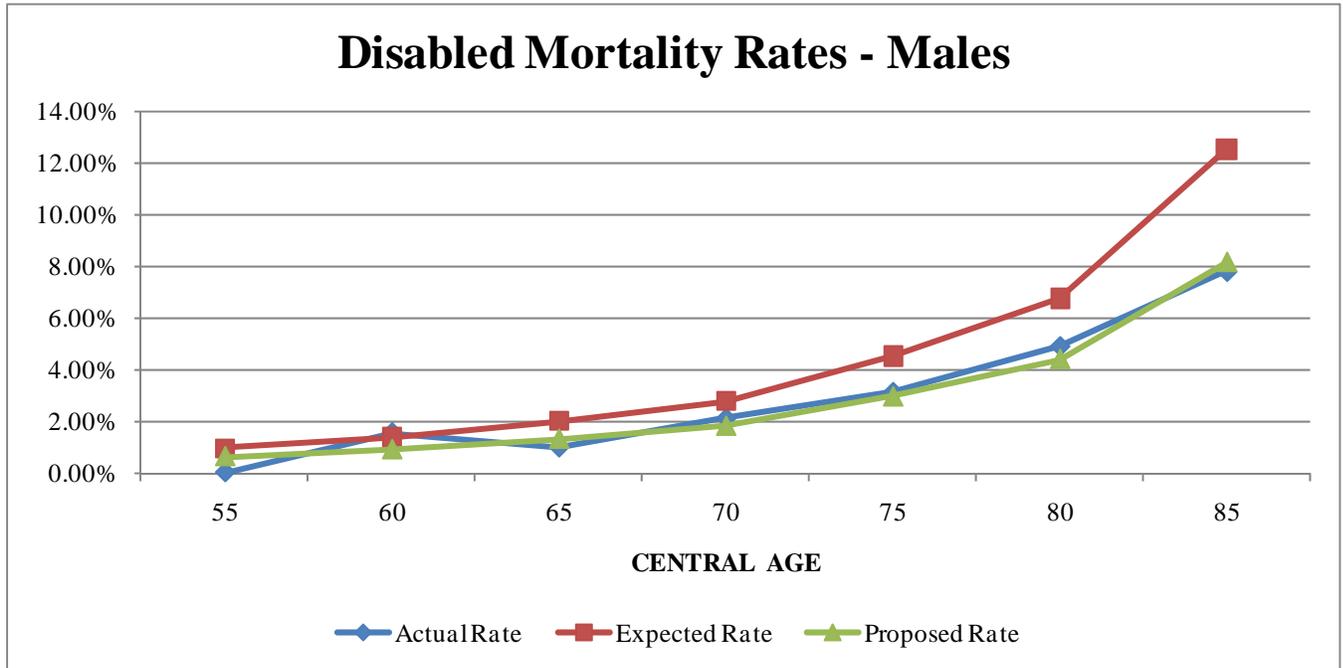


The following graphs show a comparison of the present, actual and, for disability retirements, proposed rates of post-retirement deaths.

**POST-RETIREMENT DEATHS
SERVICE RETIREMENTS AND BENEFICIARIES
OF DECEASED MEMBERS**



**POST-RETIREMENT DEATHS
DISABILITY RETIREMENTS**



The preceding results indicate that the actual number of post-retirement deaths of service retirements for males and females was slightly less than expected. For disability retirements, the actual mortality rates were also less than expected for males.

We recommend that the rates of mortality after service retirement and for dependents of deceased pensioners be revised to the RP-2000 Combined Mortality Table projected to 2015 using a Scale AA projection rates (set forward 1 year for females). In addition, we recommend that the rates of mortality for disability retirements be revised to match the experience more closely.

The following table shows a comparison between the present and proposed rates of mortality.



COMPARATIVE RATES OF POST-RETIREMENT SERVICE RETIREMENTS AND BENEFICIARIES OF DECEASED MEMBERS

AGE	RATES OF POST-RETIREMENT DEATH			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
	SERVICE RETIREMENTS AND BENEFICIARIES			
35	0.0915%	0.0717%	0.0514%	0.0435%
40	0.1153%	0.0957%	0.0763%	0.0617%
45	0.1697%	0.1239%	0.1046%	0.0960%
50	0.2773%	0.1628%	0.1536%	0.1432%
55	0.4758%	0.2718%	0.2466%	0.2739%
60	0.8576%	0.5297%	0.4773%	0.5393%
65	1.5629%	1.0309%	0.9286%	1.0161%
70	2.5516%	1.7702%	1.4763%	1.7233%
75	4.0012%	3.0622%	2.4393%	2.7451%
80	6.6696%	5.5360%	4.2361%	4.5702%
85	10.4559%	9.9680%	7.2836%	7.8920%
90	16.4442%	17.2706%	12.5016%	13.8232%

COMPARATIVE RATES OF POST-RETIREMENT DISABILITY MORTALITY

AGE	RATES OF POST-RETIREMENT DEATH			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
	DISABILITY RETIREMENTS			
35	0.9033%	0.5871%	0.5616%	0.3650%
40	0.9033%	0.5871%	0.5616%	0.3650%
45	0.9033%	0.5871%	0.5616%	0.3650%
50	0.9033%	0.5871%	0.5616%	0.3650%
55	0.9033%	0.5871%	0.5616%	0.3650%
60	1.3029%	0.8469%	0.8310%	0.5402%
65	1.9717%	1.2816%	1.2864%	0.8362%
70	2.6405%	1.7163%	1.7417%	1.1321%
75	4.5690%	2.9699%	2.9850%	1.9403%
80	6.4974%	4.2233%	4.2282%	2.7483%
85	11.0888%	7.2077%	8.2205%	5.3433%
90	15.6801%	10.1921%	12.2128%	7.9383%



The following shows a comparison of the actual and expected post-retirement deaths based on new revised rates of disability mortality.

**COMPARISON OF ACTUAL AND EXPECTED CASES OF
POST-RETIREMENT DEATHS BASED ON REVISED MORTALITY RATES**

CENTRAL AGE OF GROUP	NUMBER OF POST-RETIREMENT DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to	Actual	Expected	Ratio of Actual to
	SERVICE RETIREMENTS AND BENEFICIARIES					
52 and Under	1	0	0.000	3	0	0.000
55	4	1	4.000	1	0	0.000
60	8	4	2.000	2	1	2.000
65	9	10	0.900	3	2	1.500
70	18	14	1.286	8	4	2.000
75	13	12	1.083	6	6	1.000
80	10	13	0.769	8	15	0.533
85	3	8	0.375	21	20	1.050
90	6	5	1.200	25	25	1.000
95	0	1	0.000	7	10	0.700
98 & over	1	0	0.000	4	4	1.000
TOTAL	73	68	1.074	88	87	1.011
	DISABILITY RETIREMENTS					
47 and Under	0	0	0.000	0	0	0.000
50	0	0	0.000	1	0	0.000
55	0	1	0.000	0	0	0.000
60	3	2	1.500	0	0	0.000
65	3	4	0.750	0	0	0.000
70	7	6	1.167	0	0	0.000
75	7	7	1.000	0	0	0.000
80	11	10	1.100	0	0	0.000
85	13	14	0.929	0	0	0.000
88 & over	26	21	1.238	0	0	0.000
TOTAL	70	65	1.077	1	0	0.000



FIREFIGHTERS' RETIREMENT PLAN

RATES OF SALARY INCREASE

**COMPARISON OF ACTUAL AND EXPECTED SALARIES
OF ACTIVE MEMBERS**

SERVICE OF GROUP	SALARIES AT END OF YEAR (1000's)		
	MALES AND FEMALES		
	Actual	Expected	Ratio of Actual to
0	16,979	17,682	0.960
1	20,445	21,059	0.971
2	27,585	27,885	0.989
3	20,562	21,321	0.964
4	18,324	18,445	0.993
5 - 9	68,059	69,757	0.976
10 - 14	45,646	46,591	0.980
15 - 19	87,621	90,659	0.966
20 - 24	85,381	89,131	0.958
25 - 29	37,709	39,411	0.957
30 +	5,758	5,895	0.977
TOTAL	434,069	447,836	0.969

The preceding results indicate that salary increases were significantly less than expected over this four-year period. However, it is our understanding that future rates of salary increase are assumed to match current assumptions. Therefore, we recommend no change in the rates of salary increase at this time.



OTHER ASSUMPTIONS AND METHODS

ASSETS: Currently 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 one-seventh of the difference between market value and expected actuarial value. The actuarial value of assets is constrained to an 80% to 120% corridor around the market value of assets. In addition, there is an adjustment made for the effect of the adjustment pursuant to D.C. Code §1-907.02(c). We recommend maintaining the current smoothing method.

PERCENT MARRIED: Currently 80% of active members are assumed to be married with the male three years older than his spouse. Active members are assumed to have one child age ten. Since the data we currently have does not include spousal information, we will recommend no change to this assumption at this time, but will review closely during the next experience study.

VALUATION COST METHOD: Currently the valuation uses the Aggregate Actuarial Cost Method. While there is no issue with that method, we would suggest seeking legislation to allow a change to the Entry Age Normal (EAN) cost method. The EAN cost method is the most widely used cost method of large public sector plans and has demonstrated the highest degree of contribution stability as compared to alternative methods. Actuarial gains and losses under EAN are reflected in the unfunded actuarial accrued liability.

WITHDRAWAL ASSUMPTION: It is assumed that 80% of the vested members who terminate elect to withdraw their contributions while the remaining 20% elect to leave their contributions in the plan in order to be eligible for a benefit at their retirement date. We recommend no change to this assumption, but will review this assumption more closely during the next experience study.

PRE-RETIREMENT DEATH BENEFITS: To value the pre-retirement death benefit, the benefit form for all retirements (normal or disabled) is assumed to be a 67.8% Joint and Survivor annuity for all participants (based on 40% of average pay survivor benefits). One-fourth of all active deaths are assumed to occur in the line of duty. We recommend maintaining this assumption.

PERCENT OF DISABILITY: Three-fourths of all disabilities are assumed to occur in the line of duty. For all disability retirements occurring in the line of duty, the percent of disability is assumed to be 100%. We recommend no change to these assumptions.



Appendix A

Historical September CPI (U) Index

Year	CPI (U)	Year	CPI (U)
1960	29.6	1986	110.2
1961	30.0	1987	115.0
1962	30.4	1988	119.8
1963	30.7	1989	125.0
1964	31.1	1990	132.7
1965	31.6	1991	137.2
1966	32.7	1992	141.3
1967	33.6	1993	145.1
1968	35.1	1994	149.4
1969	37.1	1995	153.2
1970	39.2	1996	157.8
1971	40.8	1997	161.2
1972	42.1	1998	163.6
1973	45.2	1999	167.9
1974	50.6	2000	173.7
1975	54.6	2001	178.3
1976	57.6	2002	181.0
1977	61.4	2003	185.2
1978	66.5	2004	189.9
1979	74.6	2005	198.8
1980	84.0	2006	202.9
1981	93.2	2007	208.490
1982	97.9	2008	218.783
1983	100.7	2009	215.969
1984	105.0	2010	218.439
1985	108.3		



Appendix B

Capital Market Assumptions and Asset Allocation

Real Rates of Return and Standard Deviations by Asset Class

Asset Class	Expected Real Rate of Return	Standard Deviation
Public Domestic Equity	5.1%	17.0%
Public Foreign Equity (Dev)	5.0%	19.0%
Public Foreign Equity (Emerg)	6.9%	26.0%
Investment Grade Bonds	0.2%	5.5%
TIPS	1.4%	7.0%
High Yield Bonds	3.7%	12.0%
Foreign Bonds (Dev)	1.0%	12.0%
Emerging Market Debts (Local)	3.5%	15.0%
Real Estate	4.6%	17.0%
Infrastructure	5.7%	18.0%
Private Equity	7.3%	25.0%
Hedge Funds	3.4%	10.5%

Asset Allocation Targets

Asset Class	Asset Allocation
Public Domestic Equity	22%
Public Foreign Equity (Dev)	20%
Public Foreign Equity (Emerg)	8%
Investment Grade Bonds	15%
TIPS	3%
High Yield Bonds	3%
Foreign Bonds (Dev)	2%
Emerging Market Debts (Local)	2%
Real Estate	5%
Infrastructure	2%
Private Equity	8%
Hedge Funds	10%



Asset Correlation Matrix

ASSET CLASS	Public Dom Equity	Public Foreign Equity (Dev)	Public Foreign Equity (Eme)	Invest Grade Bonds	TIPS	High Yield Bonds	Foreign Bonds (Dev)	Eme Markets Debts (Local)	Real Estate	Infra-structure	Private Equity	Hedge Funds
Public Dom Equity	1.00											
Public Foreign Equity (Dev)	0.80	1.00										
Public Foreign Equity (Eme)	0.80	0.80	1.00									
Invest Grade Bonds	0.30	0.20	0.00	1.00								
TIPS	0.00	0.10	0.10	0.80	1.00							
High Yield Bonds	0.70	0.60	0.50	0.40	0.30	1.00						
Foreign Bonds (Dev)	0.10	0.50	0.20	0.50	0.60	0.10	1.00					
Eme Markets Debts (Local)	0.60	0.60	0.70	0.40	0.20	0.50	0.30	1.00				
Real Estate	0.40	0.40	0.30	0.30	0.10	0.50	0.10	0.10	1.00			
Infrastructure	0.40	0.40	0.40	0.40	0.30	0.50	0.10	0.20	0.50	1.00		
Private Equity	0.80	0.70	0.60	0.20	0.00	0.70	0.10	0.40	0.50	0.50	1.00	
Hedge Funds	0.70	0.70	0.70	0.30	0.10	0.60	0.10	0.40	0.40	0.40	0.60	1.00



Appendix C

Social Security Administration Wage Index

Year	Wage Index	Annual Increase	Year	Wage Index	Annual Increase
1959	3,855.80	4.95%	1985	16,822.51	4.26%
1960	4,007.12	3.92	1986	17,321.82	2.97
1961	4,086.76	1.99	1987	18,426.51	6.38
1962	4,291.40	5.01	1988	19,334.04	4.93
1963	4,396.64	2.45	1989	20,099.55	3.96
1964	4,576.32	4.09	1990	21,027.98	4.62
1965	4,658.72	1.80	1991	21,811.60	3.73
1966	4,938.36	6.00	1992	22,935.42	5.15
1967	5,213.44	5.57	1993	23,132.67	0.86
1968	5,571.76	6.87	1994	23,753.53	2.68
1969	5,893.76	5.78	1995	24,705.66	4.01
1970	6,186.24	4.96	1996	25,913.90	4.89
1971	6,497.08	5.02	1997	27,426.00	5.84
1972	7,133.80	9.80	1998	28,861.44	5.23
1973	7,580.16	6.26	1999	30,469.84	5.57
1974	8,030.76	5.94	2000	32,154.82	5.53
1975	8,630.92	7.47	2001	32,921.92	2.39
1976	9,226.48	6.90	2002	33,252.09	1.00
1977	9,779.44	5.99	2003	34,064.95	2.44
1978	10,556.03	7.94	2004	35,648.55	4.65
1979	11,479.46	8.75	2005	36,952.94	3.66
1980	12,513.46	9.01	2006	38,651.41	4.60
1981	13,773.10	10.07	2007	40,405.48	4.54
1982	14,531.34	5.51	2008	41,334.97	2.30
1983	15,239.24	4.87	2009	40,711.61	(1.50)
1984	16,135.07	5.88			



APPENDIX D
TABLE 1
TEACHERS' RETIREMENT PLAN
RATES OF SEPARATION FROM ACTIVE SERVICE

AGE	Rates of Withdrawal			Rates of Disability Retirement	Rates of Service Retirement	
	Less than 4 Years of Service	4 to 9 Years of Service	10 or More Years of Service		Less than 30 Years of Service	30 or More Years of Service
20	0.2500	0.0000	0.0000	0.00030		
21	0.2500	0.2000	0.0000	0.00030		
22	0.2500	0.2000	0.0000	0.00030		
23	0.2500	0.2000	0.0000	0.00030		
24	0.2500	0.2000	0.0000	0.00030		
25	0.2350	0.2000	0.0000	0.00030		
26	0.2350	0.1920	0.0000	0.00034		
27	0.2350	0.1840	0.0000	0.00038		
28	0.2350	0.1760	0.0375	0.00042		
29	0.2350	0.1680	0.0375	0.00046		
30	0.2200	0.1600	0.0375	0.00050		
31	0.2200	0.1560	0.0375	0.00054		
32	0.2200	0.1520	0.0375	0.00058		
33	0.2200	0.1480	0.0375	0.00062		
34	0.2200	0.1440	0.0375	0.00066		
35	0.2050	0.1400	0.0375	0.00070		
36	0.2050	0.1360	0.0375	0.00074		
37	0.2050	0.1320	0.0375	0.00078		
38	0.2050	0.1280	0.0375	0.00082		
39	0.2050	0.1240	0.0375	0.00086		
40	0.1900	0.1200	0.0375	0.00090		
41	0.1900	0.1160	0.0375	0.00102		
42	0.1900	0.1120	0.0375	0.00114		
43	0.1900	0.1080	0.0375	0.00126		
44	0.1900	0.1040	0.0375	0.00138		
45	0.1750	0.1000	0.0375	0.00150		
46	0.1750	0.1000	0.0375	0.00164		
47	0.1750	0.1000	0.0375	0.00178		
48	0.1750	0.1000	0.0375	0.00192		
49	0.1750	0.1000	0.0375	0.00206		
50	0.1600	0.1000	0.0375	0.00220	0.025	0.025
51	0.1600	0.1000	0.0375	0.00240	0.025	0.025
52	0.1600	0.1000	0.0375	0.00260	0.025	0.025
53	0.1600	0.1000	0.0375	0.00280	0.025	0.025
54	0.1600	0.1000	0.0375	0.00300	0.025	0.025
55	0.1450	0.1000	0.0375	0.00320	0.060	0.330
56	0.1450	0.1000	0.0375	0.00336	0.060	0.190
57	0.1450	0.1000	0.0375	0.00352	0.060	0.190
58	0.1450	0.1000	0.0375	0.00368	0.090	0.190
59	0.1450	0.1000	0.0375	0.00384	0.100	0.250
60	0.1300	0.1000	0.0375	0.00400	0.270	0.250
61	0.1300	0.1000	0.0375	0.00400	0.250	0.250
62	0.1300	0.1000	0.0375	0.00400	0.250	0.250
63	0.1300	0.1000	0.0375	0.00400	0.220	0.250
64	0.1300	0.1000	0.0375	0.00400	0.200	0.250
65	0.0000	0.0000	0.0000	0.00000	0.200	0.250
66					0.200	0.250
67					0.200	0.250
68					0.200	0.250
69					0.200	0.300
70					0.300	0.300
71					0.250	0.400
72					0.250	0.500
73					0.250	0.250
74					0.250	0.250
75					1.000	1.000



TABLE 2
POLICE OFFICERS' RETIREMENT PLAN
RATES OF SEPARATION FROM ACTIVE SERVICE

AGE	Rates of Withdrawal			Rates of Disability Retirement		SERVICE	Rates of Service Retirement*
	Less than 3 Years of Service	3 or More Years of Service		MALES	FEMALES		
		MALES	FEMALES				
20	0.10	0.000	0.000	0.00020	0.00040	Under 25	0.125
21	0.10	0.060	0.025	0.00026	0.00048	25	0.220
22	0.10	0.060	0.025	0.00032	0.00056	26	0.350
23	0.10	0.060	0.025	0.00038	0.00064	27	0.320
24	0.10	0.060	0.025	0.00044	0.00072	28	0.350
25	0.10	0.060	0.025	0.00050	0.00080	29	0.300
26	0.10	0.057	0.027	0.00060	0.00088	30	0.150
27	0.10	0.053	0.029	0.00070	0.00096	31	0.300
28	0.10	0.050	0.031	0.00080	0.00104	32	0.220
29	0.10	0.046	0.033	0.00090	0.00112	33	0.320
30	0.10	0.043	0.035	0.00100	0.00120	34	0.200
31	0.10	0.039	0.032	0.00124	0.00152	35	0.200
32	0.10	0.036	0.029	0.00148	0.00184	36	0.200
33	0.10	0.032	0.026	0.00172	0.00216	37	0.200
34	0.10	0.029	0.023	0.00196	0.00248	38	0.200
35	0.10	0.025	0.020	0.00220	0.00280	39	0.200
36	0.10	0.024	0.019	0.00226	0.00304	40 & Over	0.200
37	0.10	0.022	0.018	0.00232	0.00328		
38	0.10	0.021	0.017	0.00238	0.00352		
39	0.10	0.019	0.016	0.00244	0.00376		
40	0.10	0.018	0.015	0.00250	0.00400		
41	0.10	0.017	0.015	0.00260	0.00444		
42	0.10	0.016	0.014	0.00270	0.00488		
43	0.10	0.015	0.014	0.00280	0.00532		
44	0.10	0.014	0.013	0.00290	0.00576		
45	0.10	0.013	0.013	0.00300	0.00620		
46	0.10	0.013	0.013	0.00320	0.00636		
47	0.10	0.013	0.013	0.00340	0.00652		
48	0.10	0.013	0.013	0.00360	0.00668		
49	0.10	0.013	0.013	0.00380	0.00684		
50	0.10	0.013	0.013	0.00400	0.00700		
51	0.10	0.013	0.013	0.00440	0.00710		
52	0.10	0.013	0.013	0.00480	0.00720		
53	0.10	0.013	0.013	0.00520	0.00730		
54	0.10	0.013	0.013	0.00560	0.00740		
55	0.10	0.013	0.013	0.00600	0.00750		
56	0.10	0.013	0.013	0.00640	0.00780		
57	0.10	0.013	0.013	0.00680	0.00810		
58	0.10	0.013	0.013	0.00720	0.00840		
59	0.10	0.013	0.013	0.00760	0.00870		
60	0.00	0.000	0.000	0.00800	0.00900		

*Assumed rate of retirement is 100% at age 65, regardless of service



TABLE 3
FIREFIGHTERS' RETIREMENT PLAN
RATES OF SEPARATION FROM ACTIVE SERVICE

AGE	Rates of Withdrawal		Rates of Disability Retirement	YEARS OF SERVICE	Rates of Service Retirement*
	Less than 2 Years of Service	2 or More Years of Service			
20	0.090	0.035	0.00010	20	0.125
21	0.090	0.035	0.00012	21	0.125
22	0.090	0.035	0.00014	22	0.125
23	0.090	0.035	0.00016	23	0.125
24	0.090	0.035	0.00018	24	0.125
25	0.090	0.035	0.00020	25	0.125
26	0.090	0.032	0.00046	26	0.125
27	0.090	0.029	0.00072	27	0.125
28	0.090	0.026	0.00098	28	0.125
29	0.090	0.023	0.00124	29	0.125
30	0.090	0.020	0.00150	30	0.200
31	0.090	0.018	0.00160	31	0.300
32	0.090	0.016	0.00170	32	0.400
33	0.090	0.014	0.00180	33	0.400
34	0.090	0.012	0.00190	34	0.400
35	0.090	0.010	0.00200	35 & Over	0.400
36	0.090	0.010	0.00230		
37	0.090	0.010	0.00260		
38	0.090	0.010	0.00290		
39	0.090	0.010	0.00320		
40	0.090	0.010	0.00350		
41	0.090	0.011	0.00370		
42	0.090	0.012	0.00390		
43	0.090	0.013	0.00410		
44	0.090	0.014	0.00430		
45	0.090	0.015	0.00450		
46	0.090	0.015	0.00464		
47	0.090	0.015	0.00478		
48	0.090	0.015	0.00492		
49	0.090	0.015	0.00506		
50	0.090	0.015	0.00520		
51	0.090	0.012	0.00536		
52	0.090	0.009	0.00552		
53	0.090	0.006	0.00568		
54	0.090	0.003	0.00584		
55	0.090	0.000	0.00600		
56	0.090	0.000	0.00620		
57	0.090	0.000	0.00640		
58	0.090	0.000	0.00660		
59	0.090	0.000	0.00680		
60	0.000	0.000	0.00700		
61			0.00467		
62			0.00233		
63			0.00000		

*Assumed rate of retirement is 100% at age 60, regardless of service.



TABLE 4
TEACHERS' RETIREMENT PLAN
RATES OF MORTALITY FOR ACTIVE MEMBERS, SERVICE RETIREMENTS
AND BENEFICIARIES OF DECEASED MEMBERS

AGE	MALES	FEMALES	AGE	MALES	FEMALES
18	0.000237	0.000138	70	0.017702	0.011282
19	0.000248	0.000141	71	0.019586	0.012284
20	0.000259	0.000144	72	0.021747	0.013577
21	0.000272	0.000145	73	0.024223	0.015068
22	0.000283	0.000147	74	0.027024	0.016721
23	0.000297	0.000150	75	0.030622	0.018319
24	0.000309	0.000153	76	0.034131	0.020363
25	0.000323	0.000157	77	0.038547	0.022912
26	0.000345	0.000164	78	0.043489	0.025295
27	0.000354	0.000168	79	0.049071	0.027869
28	0.000365	0.000173	80	0.055360	0.030694
29	0.000382	0.000179	81	0.062905	0.033835
30	0.000412	0.000192	82	0.071350	0.037355
31	0.000463	0.000208	83	0.079534	0.041291
32	0.000521	0.000220	84	0.089800	0.045702
33	0.000585	0.000231	85	0.099680	0.051435
34	0.000651	0.000264	86	0.110516	0.057979
35	0.000717	0.000296	87	0.124300	0.065461
36	0.000780	0.000329	88	0.139683	0.072927
37	0.000839	0.000357	89	0.154366	0.082570
38	0.000881	0.000384	90	0.172706	0.092092
39	0.000919	0.000410	91	0.188113	0.102574
40	0.000957	0.000442	92	0.207060	0.113903
41	0.000997	0.000477	93	0.223365	0.127786
42	0.001045	0.000517	94	0.239646	0.140326
43	0.001100	0.000563	95	0.259578	0.152955
44	0.001166	0.000617	96	0.275506	0.165391
45	0.001239	0.000669	97	0.290981	0.180076
46	0.001308	0.000725	98	0.310600	0.191612
47	0.001382	0.000784	99	0.325288	0.202320
48	0.001460	0.000856	100	0.339424	0.212034
49	0.001543	0.000931	101	0.358628	0.223947
50	0.001628	0.001025	102	0.371685	0.231387
51	0.001837	0.001126	103	0.383040	0.237467
52	0.001970	0.001255	104	0.392003	0.244834
53	0.002154	0.001398	105	0.397886	0.254498
54	0.002360	0.001593	106	0.400000	0.266044
55	0.002718	0.001789	107	0.400000	0.279055
56	0.003198	0.002016	108	0.400000	0.293116
57	0.003629	0.002248	109	0.400000	0.307811
58	0.004140	0.002520	110	0.400000	0.322725
59	0.004667	0.002866	111	0.400000	0.337441
60	0.005297	0.003226	112	0.400000	0.351544
61	0.006119	0.003639	113	0.400000	0.364617
62	0.006981	0.004119	114	0.400000	0.376246
63	0.008104	0.004689	115	0.400000	0.386015
64	0.009130	0.005393	116	0.400000	0.393507
65	0.010309	0.006175	117	0.400000	0.398308
66	0.011841	0.007094	118	0.400000	0.400000
67	0.013210	0.007995	119	0.400000	0.400000
68	0.014464	0.009003	120	1.000000	1.000000
69	0.016027	0.010161			



TABLE 5
TEACHERS' RETIREMENT PLAN
RATES OF MORTALITY FOR DISABILITY RETIREMENTS

AGE	MALES	FEMALES	AGE	MALES	FEMALES
18	0.022571	0.007450	70	0.059613	0.028026
19	0.022571	0.007450	71	0.062583	0.029594
20	0.022571	0.007450	72	0.065841	0.031325
21	0.022571	0.007450	73	0.069405	0.033234
22	0.022571	0.007450	74	0.073292	0.035335
23	0.022571	0.007450	75	0.077512	0.037635
24	0.022571	0.007450	76	0.082067	0.040140
25	0.022571	0.007450	77	0.086951	0.042851
26	0.022571	0.007450	78	0.092149	0.045769
27	0.022571	0.007450	79	0.097640	0.048895
28	0.022571	0.007450	80	0.103392	0.052230
29	0.022571	0.007450	81	0.109372	0.055777
30	0.022571	0.007450	82	0.115544	0.059545
31	0.022571	0.007450	83	0.121877	0.063545
32	0.022571	0.007450	84	0.128343	0.067793
33	0.022571	0.007450	85	0.134923	0.072312
34	0.022571	0.007450	86	0.141603	0.077135
35	0.022571	0.007450	87	0.148374	0.082298
36	0.022571	0.007450	88	0.155235	0.087838
37	0.022571	0.007450	89	0.162186	0.093794
38	0.022571	0.007450	90	0.169233	0.100203
39	0.022571	0.007450	91	0.183408	0.107099
40	0.022571	0.007450	92	0.199769	0.114512
41	0.022571	0.007450	93	0.216605	0.122464
42	0.022571	0.007450	94	0.233662	0.130972
43	0.022571	0.007450	95	0.250693	0.140049
44	0.022571	0.007450	96	0.267491	0.149698
45	0.022571	0.007450	97	0.283905	0.159924
46	0.022571	0.007450	98	0.299852	0.170433
47	0.023847	0.007450	99	0.315296	0.182799
48	0.025124	0.007450	100	0.330207	0.194509
49	0.026404	0.007450	101	0.344556	0.205379
50	0.027687	0.007450	102	0.358628	0.215240
51	0.028975	0.008184	103	0.371685	0.223947
52	0.030268	0.008959	104	0.383040	0.231387
53	0.031563	0.009775	105	0.392003	0.237467
54	0.032859	0.010634	106	0.397886	0.244834
55	0.034152	0.011535	107	0.400000	0.254498
56	0.035442	0.012477	108	0.400000	0.266044
57	0.036732	0.013456	109	0.400000	0.279055
58	0.038026	0.014465	110	0.400000	0.293116
59	0.039334	0.015497	111	0.400000	0.307811
60	0.040668	0.016544	112	0.400000	0.322725
61	0.042042	0.017598	113	0.400000	0.337441
62	0.043474	0.018654	114	0.400000	0.351544
63	0.044981	0.019710	115	0.400000	0.364617
64	0.046584	0.020768	116	0.400000	0.376246
65	0.048307	0.021839	117	0.400000	0.386015
66	0.050174	0.022936	118	0.400000	0.393507
67	0.052213	0.024080	119	0.400000	0.398308
68	0.054450	0.025293	120	1.000000	1.000000
69	0.056909	0.026600			



TABLE 6
POLICE OFFICERS' RETIREMENT PLAN
RATES OF MORTALITY FOR ACTIVE MEMBERS, SERVICE RETIREMENTS
AND BENEFICIARIES OF DECEASED MEMBERS

AGE	MALES	FEMALES	AGE	MALES	FEMALES
18	0.000237	0.000154	70	0.017702	0.017233
19	0.000248	0.000152	71	0.019586	0.018881
20	0.000259	0.000151	72	0.021747	0.020987
21	0.000272	0.000150	73	0.024223	0.022912
22	0.000283	0.000152	74	0.027024	0.025295
23	0.000297	0.000158	75	0.030622	0.027451
24	0.000309	0.000165	76	0.034131	0.030234
25	0.000323	0.000173	77	0.038547	0.033835
26	0.000345	0.000186	78	0.043489	0.037355
27	0.000354	0.000196	79	0.049071	0.041291
28	0.000365	0.000207	80	0.055360	0.045702
29	0.000382	0.000220	81	0.062905	0.050664
30	0.000412	0.000264	82	0.071350	0.056255
31	0.000463	0.000310	83	0.079534	0.062565
32	0.000521	0.000349	84	0.089800	0.069701
33	0.000585	0.000380	85	0.099680	0.078920
34	0.000651	0.000409	86	0.110516	0.089359
35	0.000717	0.000435	87	0.124300	0.101042
36	0.000780	0.000462	88	0.139683	0.112202
37	0.000839	0.000491	89	0.154366	0.125879
38	0.000881	0.000524	90	0.172706	0.138232
39	0.000919	0.000563	91	0.188113	0.150672
40	0.000957	0.000617	92	0.207060	0.162922
41	0.000997	0.000679	93	0.223365	0.177391
42	0.001045	0.000747	94	0.239646	0.188755
43	0.001100	0.000820	95	0.259578	0.199303
44	0.001166	0.000896	96	0.275506	0.208872
45	0.001239	0.000960	97	0.290981	0.220611
46	0.001308	0.001025	98	0.310600	0.227940
47	0.001382	0.001092	99	0.325288	0.233930
48	0.001460	0.001180	100	0.339424	0.241187
49	0.001543	0.001276	101	0.358628	0.254498
50	0.001628	0.001432	102	0.371685	0.266044
51	0.001837	0.001584	103	0.383040	0.279055
52	0.001970	0.001786	104	0.392003	0.293116
53	0.002154	0.002022	105	0.397886	0.307811
54	0.002360	0.002337	106	0.400000	0.322725
55	0.002718	0.002739	107	0.400000	0.337441
56	0.003198	0.003178	108	0.400000	0.351544
57	0.003629	0.003639	109	0.400000	0.364617
58	0.004140	0.004119	110	0.400000	0.376246
59	0.004667	0.004689	111	0.400000	0.386015
60	0.005297	0.005393	112	0.400000	0.393507
61	0.006119	0.006175	113	0.400000	0.398308
62	0.006981	0.007094	114	0.400000	0.400000
63	0.008104	0.007995	115	0.400000	0.400000
64	0.009130	0.009003	116	0.400000	0.400000
65	0.010309	0.010161	117	0.400000	0.400000
66	0.011841	0.011282	118	1.000000	0.400000
67	0.013210	0.012471	119	1.000000	1.000000
68	0.014464	0.013784	120	1.000000	1.000000
69	0.016027	0.015529			



TABLE 7
POLICE OFFICERS' RETIREMENT PLAN
RATES OF MORTALITY FOR DISABILITY RETIREMENTS

AGE	MALES	FEMALES	AGE	MALES	FEMALES
20	0.008039	0.004998	66	0.018739	0.012259
21	0.008039	0.004998	67	0.019929	0.013070
22	0.008039	0.004998	68	0.021120	0.013880
23	0.008039	0.004998	69	0.022310	0.014690
24	0.008039	0.004998	70	0.023500	0.015501
25	0.008039	0.004998	71	0.026933	0.017715
26	0.008039	0.004998	72	0.030366	0.019927
27	0.008039	0.004998	73	0.033799	0.022141
28	0.008039	0.004998	74	0.037231	0.024353
29	0.008039	0.004998	75	0.040664	0.026567
30	0.008039	0.004998	76	0.044096	0.028779
31	0.008039	0.004998	77	0.047529	0.030992
32	0.008039	0.004998	78	0.050961	0.033205
33	0.008039	0.004998	79	0.054394	0.035418
34	0.008039	0.004998	80	0.057827	0.037631
35	0.008039	0.004998	81	0.066000	0.044738
36	0.008039	0.004998	82	0.074172	0.051843
37	0.008039	0.004998	83	0.082345	0.058950
38	0.008039	0.004998	84	0.090517	0.066056
39	0.008039	0.004998	85	0.098690	0.073162
40	0.008039	0.004998	86	0.130342	0.105836
41	0.008039	0.004998	87	0.161995	0.138510
42	0.008039	0.004998	88	0.193647	0.171183
43	0.008039	0.004998	89	0.225300	0.203856
44	0.008039	0.004998	90	0.139553	0.108694
45	0.008039	0.004998	91	0.177075	0.147760
46	0.008039	0.004998	92	0.214598	0.186824
47	0.008039	0.004998	93	0.252120	0.225890
48	0.008039	0.004998	94	0.289642	0.264955
49	0.008039	0.004998	95	0.327165	0.304020
50	0.008039	0.004998	96	0.364687	0.343086
51	0.008039	0.004998	97	0.402210	0.382151
52	0.008039	0.004998	98	0.439732	0.421217
53	0.008039	0.004998	99	0.477254	0.460281
54	0.008039	0.004998	100	0.514777	0.499347
55	0.008039	0.004998	101	0.552298	0.538413
56	0.008750	0.005478	102	0.589821	0.577477
57	0.009462	0.005958	103	0.627343	0.616543
58	0.010174	0.006436	104	0.664866	0.655608
59	0.010885	0.006916	105	0.702388	0.694673
60	0.011596	0.007396	106	0.739910	0.733739
61	0.012787	0.008207	107	0.777433	0.772804
62	0.013977	0.009017	108	0.814955	0.811870
63	0.015167	0.009827	109	0.852478	0.850934
64	0.016357	0.010638	110	1.000000	1.000000
65	0.017548	0.011449			



TABLE 8
FIREFIGHTERS' RETIREMENT PLAN
RATES OF MORTALITY FOR SERVICE RETIREMENTS
AND BENEFICIARIES OF DECEASED MEMBERS

AGE	MALES	FEMALES	AGE	MALES	FEMALES
18	0.000237	0.000154	70	0.017702	0.017233
19	0.000248	0.000152	71	0.019586	0.018881
20	0.000259	0.000151	72	0.021747	0.020987
21	0.000272	0.000150	73	0.024223	0.022912
22	0.000283	0.000152	74	0.027024	0.025295
23	0.000297	0.000158	75	0.030622	0.027451
24	0.000309	0.000165	76	0.034131	0.030234
25	0.000323	0.000173	77	0.038547	0.033835
26	0.000345	0.000186	78	0.043489	0.037355
27	0.000354	0.000196	79	0.049071	0.041291
28	0.000365	0.000207	80	0.055360	0.045702
29	0.000382	0.000220	81	0.062905	0.050664
30	0.000412	0.000264	82	0.071350	0.056255
31	0.000463	0.000310	83	0.079534	0.062565
32	0.000521	0.000349	84	0.089800	0.069701
33	0.000585	0.000380	85	0.099680	0.078920
34	0.000651	0.000409	86	0.110516	0.089359
35	0.000717	0.000435	87	0.124300	0.101042
36	0.000780	0.000462	88	0.139683	0.112202
37	0.000839	0.000491	89	0.154366	0.125879
38	0.000881	0.000524	90	0.172706	0.138232
39	0.000919	0.000563	91	0.188113	0.150672
40	0.000957	0.000617	92	0.207060	0.162922
41	0.000997	0.000679	93	0.223365	0.177391
42	0.001045	0.000747	94	0.239646	0.188755
43	0.001100	0.000820	95	0.259578	0.199303
44	0.001166	0.000896	96	0.275506	0.208872
45	0.001239	0.000960	97	0.290981	0.220611
46	0.001308	0.001025	98	0.310600	0.227940
47	0.001382	0.001092	99	0.325288	0.233930
48	0.001460	0.001180	100	0.339424	0.241187
49	0.001543	0.001276	101	0.358628	0.254498
50	0.001628	0.001432	102	0.371685	0.266044
51	0.001837	0.001584	103	0.383040	0.279055
52	0.001970	0.001786	104	0.392003	0.293116
53	0.002154	0.002022	105	0.397886	0.307811
54	0.002360	0.002337	106	0.400000	0.322725
55	0.002718	0.002739	107	0.400000	0.337441
56	0.003198	0.003178	108	0.400000	0.351544
57	0.003629	0.003639	109	0.400000	0.364617
58	0.004140	0.004119	110	0.400000	0.376246
59	0.004667	0.004689	111	0.400000	0.386015
60	0.005297	0.005393	112	0.400000	0.393507
61	0.006119	0.006175	113	0.400000	0.398308
62	0.006981	0.007094	114	0.400000	0.400000
63	0.008104	0.007995	115	0.400000	0.400000
64	0.009130	0.009003	116	0.400000	0.400000
65	0.010309	0.010161	117	0.400000	0.400000
66	0.011841	0.011282	118	1.000000	0.400000
67	0.013210	0.012471	119	1.000000	1.000000
68	0.014464	0.013784	120	1.000000	1.000000
69	0.016027	0.015529			



TABLE 9
FIREFIGHTERS' RETIREMENT PLAN
RATES OF MORTALITY FOR DISABILITY RETIREMENTS

AGE	MALES	FEMALES	AGE	MALES	FEMALES
20	0.005871	0.003650	66	0.013686	0.008953
21	0.005871	0.003650	67	0.014555	0.009545
22	0.005871	0.003650	68	0.015425	0.010137
23	0.005871	0.003650	69	0.016294	0.010729
24	0.005871	0.003650	70	0.017163	0.011321
25	0.005871	0.003650	71	0.019670	0.012938
26	0.005871	0.003650	72	0.022177	0.014554
27	0.005871	0.003650	73	0.024684	0.016170
28	0.005871	0.003650	74	0.027191	0.017786
29	0.005871	0.003650	75	0.029699	0.019403
30	0.005871	0.003650	76	0.032205	0.021018
31	0.005871	0.003650	77	0.034712	0.022635
32	0.005871	0.003650	78	0.037219	0.024251
33	0.005871	0.003650	79	0.039726	0.025867
34	0.005871	0.003650	80	0.042233	0.027483
35	0.005871	0.003650	81	0.048202	0.032674
36	0.005871	0.003650	82	0.054170	0.037863
37	0.005871	0.003650	83	0.060139	0.043053
38	0.005871	0.003650	84	0.066108	0.048243
39	0.005871	0.003650	85	0.072077	0.053433
40	0.005871	0.003650	86	0.095194	0.077296
41	0.005871	0.003650	87	0.118311	0.101159
42	0.005871	0.003650	88	0.141428	0.125021
43	0.005871	0.003650	89	0.164545	0.148884
44	0.005871	0.003650	90	0.101921	0.079383
45	0.005871	0.003650	91	0.129325	0.107914
46	0.005871	0.003650	92	0.156729	0.136445
47	0.005871	0.003650	93	0.184133	0.164976
48	0.005871	0.003650	94	0.211537	0.193506
49	0.005871	0.003650	95	0.238941	0.222037
50	0.005871	0.003650	96	0.266345	0.250569
51	0.005871	0.003650	97	0.293749	0.279099
52	0.005871	0.003650	98	0.321153	0.307630
53	0.005871	0.003650	99	0.348557	0.336161
54	0.005871	0.003650	100	0.375961	0.364692
55	0.005871	0.003650	101	0.403364	0.393223
56	0.006391	0.004001	102	0.430768	0.421753
57	0.006910	0.004351	103	0.458172	0.450284
58	0.007430	0.004701	104	0.485576	0.478815
59	0.007950	0.005051	105	0.512980	0.507346
60	0.008469	0.005402	106	0.540384	0.535877
61	0.009339	0.005994	107	0.567788	0.564407
62	0.010208	0.006585	108	0.595192	0.592938
63	0.011077	0.007177	109	0.622596	0.621469
64	0.011946	0.007769	110	1.000000	1.000000
65	0.012816	0.008362			



TABLE 10
RATES OF ANTICIPATED SALARY INCREASES

YEARS OF SERVICE	TEACHERS	POLICE OFFICERS	FIREFIGHTERS
0	0.0850	0.0950	0.0700
1	0.0850	0.0950	0.0700
2	0.0850	0.0950	0.0700
3	0.0850	0.0950	0.0700
4	0.0850	0.0806	0.0700
5	0.0850	0.0806	0.0700
6	0.0830	0.0806	0.0700
7	0.0810	0.0725	0.0700
8	0.0790	0.0719	0.0700
9	0.0770	0.0714	0.0700
10	0.0750	0.0708	0.0700
11	0.0650	0.0703	0.0700
12	0.0600	0.0698	0.0700
13	0.0550	0.0692	0.0700
14	0.0500	0.0687	0.0700
15	0.0500	0.0681	0.0700
16	0.0500	0.0676	0.0700
17	0.0470	0.0671	0.0700
18	0.0470	0.0665	0.0700
19	0.0470	0.0700	0.0700
20	0.0470	0.0700	0.0700
21	0.0470	0.0700	0.0700
22	0.0470	0.0700	0.0700
23	0.0470	0.0700	0.0700
24	0.0470	0.0700	0.0700
25	0.0470	0.0560	0.0700
26	0.0470	0.0550	0.0700
27	0.0470	0.0540	0.0700
28	0.0470	0.0520	0.0700
29	0.0470	0.0510	0.0700
30	0.0470	0.0500	0.0700
31 & Over	0.0470	0.0450	0.0700