

NEW HAMPSHIRE RETIREMENT SYSTEM

EXPERIENCE STUDY

JULY 1, 2005 – JUNE 30, 2010

March 1, 2011

Board of Trustees
New Hampshire Retirement System
54 Regional Drive
Concord, New Hampshire 03301-8509

Re: New Hampshire Retirement System Experience Study

Dear Board Members:

Presented in this report are the results of an Experience Study of the New Hampshire Retirement System (NHRS). The Study was conducted for the purpose of reviewing and, where necessary, updating the assumptions used in the actuarial valuation model.

The Study covers the period from July 1, 2005 through June 30, 2010. It was based upon the active, inactive and retired member data submitted for the June 30, 2005, June 30, 2006, June 30, 2007, June 30, 2008, June 30, 2009, and June 30, 2010 actuarial valuations. A file matching technique was utilized to track individual active member activity from one year to the next.

This report is divided into the following sections:

- A) Background
 - The actuarial valuation model and the need for actuarial assumptions
 - A sensitive model - why assumptions need to be reviewed
- B) Comments and Recommendations
- C) Economic Activity (excluding merit & longevity pay increases and end of career payments)
 - Investment Return
 - Inflation & Real Wage Growth

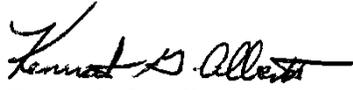
Decrement Activity and Pay Increases (Other than Wage Inflation) - Actual vs. Assumed (by Division)

- D) Employees
- E) Teachers
- F) Police
- G) Fire
- H) NHRS Retiree Mortality
- I) Other Assumptions/Methods
- J) Appendix - Comprehensive listing of recommended assumptions

The Board of Trustees
March 1, 2011
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To the best of our knowledge, the report is complete and accurate and was conducted in accordance with the standards of practice promulgated by the Actuarial Standards Board. We believe that the recommended actuarial assumptions contained in this report individually satisfy the Actuarial Standards, are consistent with the other assumptions and are reasonable and in compliance with the NHRS Statutes.

Respectfully submitted,



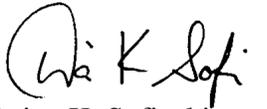
Kenneth G. Alberts



David T. Kausch, FSA, EA, MAAA



Heidi G. Barry, ASA



Daina K. Sofinski

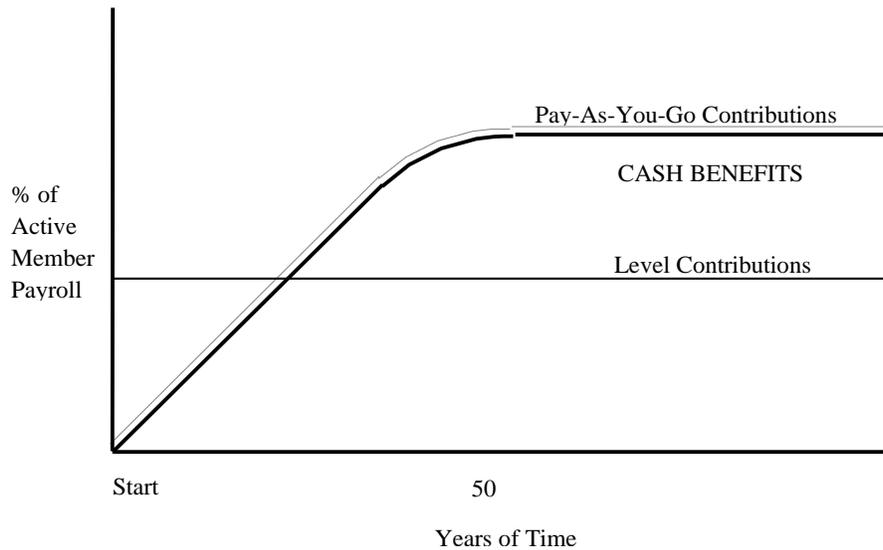
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SECTION A
BACKGROUND

THE ACTUARIAL VALUATION MODEL AND THE NEED FOR ACTUARIAL ASSUMPTIONS



When a pension plan is first implemented the cash demands are nil because there are no retired members. As the plan ages, the cash demands begin to grow as more and more members retire. If a plan follows the **pay-as-you-go principle**, the following will happen (see illustration above):

- Cash contributions will slightly exceed the cash benefits (because of administrative expenses).
- Contributions will start very low and continue to escalate as a percent of active member payroll until the plan matures, generally over a period of 50 or more years.
- Benefits accruing will become a financial obligation for future generations.
- The *entire* cost of the benefits currently accruing will be paid in the future.

Many plans, including NHRS, finance their obligations in a different manner: **Pre-funding with level percent of payroll contributions** (illustrated by the level line in the graph above). Under this arrangement the following is expected to occur:

- Cash contributions exceed cash demands in the early years of a plan, thereby building a pool of assets.

- The pool of assets generates investment income which will ultimately pay for a significant portion of the benefit obligation.
- Contributions are able to remain approximately level (as a percent of payroll) creating intergenerational equity.
- Cash demand (or benefit payments) will ultimately exceed the employer and employee contributions (the difference is paid for by investment income on the pool of assets).

The key to this second financing arrangement is the level percent of payroll contribution. This contribution is computed by the means of an actuarial valuation which is essentially a mathematical model. The mathematical model is necessary in a defined benefit plan because there are “knowns” and “unknowns” which must be evaluated before the level contribution rate can be determined. The knowns are:

- Who participates in the plan
- The demographic characteristics of each active and inactive member (i.e., age, sex, salary, service, etc.)
- The demographic characteristics of each retired member and beneficiary (i.e., age, sex, benefit, form of payment, etc.)
- The conditions and characteristics of the plan (i.e., type and amount of benefits payable, eligibility for benefits, length of time benefit is payable, etc.)
- The current purchasing power of a dollar
- The value of the pool of assets
- How the pool of assets is invested

The unknowns are:

- Who will retire and at what age, service and final average salary
- Who will quit before becoming vested
- Who will quit and be entitled to a future vested benefit
- Who will become disabled
- How long will members and their beneficiaries live (before and after retirement)
- What is the future purchasing power of a dollar (future inflation)
- How much income will the pool of assets generate

The valuation model takes the “knowns,” incorporates assumptions about the “unknowns” and develops the estimated cost of the plan for the current members. This cost is then financed using an actuarial cost method to determine the level contribution requirement.

Because future experience cannot be predicted with certainty, the costs can only be estimated. The model is revisited at least biennially to re-determine the cost estimates based upon experience which has already occurred and assumptions about future experience.

A SENSITIVE MODEL - WHY ASSUMPTIONS NEED TO BE REVIEWED

When Fund experience deviates from expected experience, a gain or loss is generated. This gain or loss is then amortized over a period of future years and applied as an offset or addition to the normal cost contribution. Over time it is expected that the gains and losses will offset each other. If they do not, then one or more of the actuarial assumptions should be modified to reflect actual emerging experience.

If the assumptions are too conservative (the estimated cost of the plan is too high) then the computed contribution rate will decrease over time. If the assumptions are too liberal (the estimated cost of the plan is too low) then the computed contribution rate will increase over time. In either case, this is not consistent with the level percent of payroll principle to establish contributions that will, over time, remain approximately level as a percent of payroll.

In addition, *each* assumption should represent a reasonable estimate of future experience. Even though a package of assumptions may produce results which are reasonable, it is important that each component of the package reflect actual expected experience. Estimated costs of benefit changes, for example, are highly dependent upon specific assumptions.

The actuarial assumptions are intended to be the best estimate of future experience of the Fund when they are adopted, but conditions change over time. In addition, our understanding of the conditions affecting plan activity change (even if the conditions themselves are not changing). It is for these reasons, and the desire to keep the computed contribution rate as level as possible, that the actuarial assumptions should be reviewed periodically and adjusted to reflect basic experience trends -- but not random year-to-year fluctuations.

SECTION B

COMMENTS AND RECOMMENDATIONS

SUMMARY, COMMENTS AND RECOMMENDATIONS

Observations:

Beginning with the June 30, 2007, actuarial valuation the funding method was changed to the entry age normal cost actuarial funding method. The prior actuarial method did not produce a measure of the accrued liability. In subsequent valuations (beginning with the June 30, 2008 valuation) the effect of gains and losses on the unfunded actuarial accrued liability were measured. The table below shows the estimated gains and losses for the pension portion of the trust:

Estimate Gain/(Loss) on Pension Portion of Fund (\$Millions)				
June 30	Total	Investment	Liability	Liability Gain/(Loss) as a % of Beginning of Year Accrued Liability
2008	\$ (25.9)	\$ 49.8	\$ (75.7)	(1.2%)
2009	\$ (891.9)	\$ (641.2)	\$ (250.7)	(3.2%)
2010	\$ 33.3	\$ (223.2)	\$ 256.5	3.2%
Total	\$ (884.5)	\$ (814.6)	\$ (69.9)	

Based on this chart, we would not expect to see dramatic changes in the demographic assumptions (assumptions about the members and their future behaviors) as a result of the study. However, this chart only represents 3 of the 5 years studied and does not provide any insight on individual assumption changes that might be needed.

This aggregate analysis sets the starting point for the experience study and suggests that we should expect slightly higher costs as a result of improvements in the demographic assumptions.

However, in many cases GRS decided to employ different approaches to the development of the assumptions. For example, there is currently one age based table (separated by Employee Group and Sex) for retirement, regardless of the eligibility conditions that are met. We have expanded this to include the following tables:

- Age based table for Group I members meeting the age 50 with 10 years of service early retirement condition (by sex);
- Rule table for Group I members meeting the rule of 70 with 20 years of service early retirement condition (by sex),
- Age based table for members meeting the normal retirement conditions (by sex).

COMMENTS AND RECOMMENDATIONS

We have also changed the manner in which withdrawal tables are applied by introducing select withdrawal tables that account for all terminations during an initial service period. It is very common for plans to experience very high turnover in the first few years of employment. We therefore are recommending the introduction of a 5 year service related withdrawal table followed by an age based withdrawal table.

One other aspect we looked at was how the salary increase table was applied. For all of the groups, salary increases appear to be better correlated with service than with age (we looked at it both ways). The prior tables were aged based. However, the recommended tables are service based.

A summary of the changes to the major assumptions follows:

Rates of Withdrawal from service without entitlement to an immediate benefit (other than a separation benefit) are segregated into two categories:

- Service based (select), covering an initial employment period
- Age based (ultimate), beginning after the initial employment period

Male and female rates were looked at independently for all groups. In addition, the length of the service-based period was reviewed.

Currently the service-based period is 2 years for Group I and 0 years for Group II. For Group I, age-based withdrawal rates are increased by a factor of 2 or 3 during the first 2 years of employment.

Experience for all groups suggests that separate service-based rates for the first five years of employment will better model that activity. In addition we recommend increases in the overall rates of termination.

Development of the rates is shown in Sections D through I.

The proposed rates are detailed in their entirety in the Appendix.

COMMENTS AND RECOMMENDATIONS

Rates of Disability from active service with entitlement to a disability benefit were studied by division. For Group I, the study was further broken down between men and women. In general, disability experience suggested only minor changes to the disability rates. Group II disability rates were studied separately for duty and non-duty.

Development of the rates is shown in Sections D through I.

The proposed rates are detailed in their entirety in the Appendix.

Rates of Retirement from service with entitlement to an immediate benefit are segregated into three categories:

- Rule-based for those members retiring under the rule of 70 with 20 years of service early retirement condition
- Age-based for those members retiring based on the age 50 with 10 years of service condition for early retirement
- Age-based for those members retiring under normal retirement

Male and female experience was studied separately for Group I and jointly for Group II. In addition, we considered serviced based tables for Group II members, but determined that Group II members rates of retirement were better correlated with age. In general, proposed rates of retirement were lowered from current assumptions. However we are recommending no changes for male teachers and increases under the early retirement rule of 70 condition for Group I members over age 55.

Mortality rates for healthy female retirees appear to contain a large margin for improved mortality. Mortality rates for healthy male retirees appear to need strengthening. Mortality rates for disabled male and female retirees appear to need strengthening for improved mortality. We have updated the healthy mortality table and the RP 2000 mortality table, projected with future mortality improvements to 2020. This table reduces the margin for females and adds a margin for males. In addition, we recommend using the same sex distinct table for all members. The proposed post-disabled mortality table is 80% of the PBGC disabled mortality table (the current table). The proposed healthy mortality tables include a margin of 15% for men and 17% for women for mortality improvements.

COMMENTS AND RECOMMENDATIONS

Merit and Longevity Salary Increases were changed from an age-based pattern to a service-based pattern. The proposed tables will result in more moderate salary increase.

Miscellaneous Observations -

- During the period studied, the member identifier was partially removed from the file. We will work with NHRS Staff to develop a unique identifier to ease tracking of members.
- GRS will work with Staff to continue to confirm the understanding of reported pays for members with less than one year of service.
- Data suggests that terminations of older members are occurring more rapidly than expected. Termination rates were not adjusted for this phenomenon. If this trend continues, we will make recommendations in the next experience study to account for this activity. In the meantime, GRS will work with Staff to confirm that these members are really terminations.

We do not currently recommend adjusting any assumption to account for these observations.

Forfeitures: Experience indicates that some vested members are refunding and forfeiting their pensions. Based on this activity, we are introducing a forfeiture assumption for vested members who terminate active service in the future. The proposed assumption is 25% of members who quit before retirement with 10-15 years of service will elect to refund and forfeit their pension.

End of Career Payments: We recommend using a 9% load for Employees, a 7% load for Teachers, and a 12% load for Group II members to model end of career compensation. The results of this portion of the experience study were consistent with the interim study performed as of June 30, 2008.

Marriage Assumption: Based on the members who retired during the study period, we recommend lowering the marriage assumption to 70% for Group I members (from 80%) and leaving the Group II members the same (50%). This assumption relates to the benefits payable resulting from death-in-service for Group I and Group II and the automatic death after retirement spousal benefit for Group II.

Administrative Expenses: biennial valuations will develop employer contribution rates net of administrative expenses. Administrative expenses will be determined by the Board through its budgeting process. NHRS staff will add the administrative expenses developed through the budgeting process to the employer rates developed in the valuation.

For comparative purposes, the cost estimates contained in this report included the current assumption of 0.35% of payroll in the normal cost.

Economic Assumptions: Economic assumptions studied in this report include:

- 1) Rates of Investment Return;
- 2) Rates of Wage Inflation;
- 3) Rates of Price Inflation;
- 4) Merit & Longevity Pay Increases; and
- 5) End of Career Payments.

The first two assumptions are studied for NHRS in total (or in aggregate) are referred to in the balance of this report as the aggregate economic assumptions. The last three are studied by employee group (Employees, Teachers, Police and Fire) and are referred to in the balance of this report as the group-specific economic assumptions. The group-specific economic assumptions recommendations can be reviewed, in part, by analyzing experience contained in the member data and are discussed with the demographic assumptions (which are reviewed in a similar manner). The member data does not contain the information needed to review the aggregate economic assumptions and therefore they are studied in a different manner.

Aggregate Economic Assumptions:

When it comes to the aggregate economic assumptions, there is no best single combination of assumptions. However, there is a range of reasonableness. We believe that the current set of aggregate economic assumptions (8.5% interest; 4.5% wage inflation) is reasonable, but aggressive. Based on the historical pattern of investment return (see Section C), the recent investment market and predominant public sector activity, an investment return of 8.00% appears to be a good “middle of the road” assumption. In addition, current economic forecasts predict that returns going forward may not be as high as they were historically and that a lowering of the interest rate assumption may be warranted.

COMMENTS AND RECOMMENDATIONS

The current wage inflation assumption appears to be slightly conservative. The increase in the national average earnings (NAE) has only exceeded the assumed rate of 4.5% twice in the last five years and only by a small margin. In addition, the 10 and 20 year averages are 3.3% and 3.8% respectively. Although NHRS experience is slightly above NAE (see page C-2), NHRS experience is trending down and is below the current assumption. Based on this, we believe that a lowering of the wage inflation assumption is warranted. Therefore, we recommend the Alternatives 2-4 (below) for discussion and consideration by the Board. Alternative 1 (below) was added at the Board's request to help identify the change in costs related to changes in the assumed investment return versus changes in the assumed wage growth.

Assumption	Current	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Investment Return	8.50%	8.50%	8.00%	7.75%	7.50%
Wage Growth	4.50%	4.00%	4.00%	3.50%	3.50%
Spread over Wage Growth	4.00%	4.50%	4.00%	4.25%	4.00%

Many other alternatives within the realm of reasonableness are possible, of course. Valuation results as of June 30, 2010 under current and proposed assumptions are summarized on the following pages. It is important to note that as of June 30, 2010, asset losses from 2009 are still being phased in and will result in upward pressure on contribution rates unless offset by future gains.

EXPECTED IMPACT OF PROPOSED CHANGES ON EMPLOYER CONTRIBUTION RATE

Group I

Employees		
Assumption	Likely Direction of Change on Employer Rate Due to Proposed	
	NC	UAAL
Rates of Age-Based Withdrawal	Moderate Decr.	Moderate Decr.
Rates of Service-Based Withdrawal	Material Decr.	Moderate Incr.
Rates of Disability	Neutral	Neutral
Rates of Age-Based Retirement	Moderate Decr.	Moderate Decr.
Rates of Age-Based Early Retirement	Marginal Decr.	Marginal Decr.
Rates of Rule-Based Early Retirement	Moderate Incr.	Moderate Incr.
Pre-Retirement Mortality	Marginal Incr.	Marginal Incr.
Post-Retirement Healthy Mortality	Moderate Incr.	Moderate Incr.
Post-Retirement Disabled Mortality	Marginal Incr.	Marginal Incr.
Merit and Longevity Salary Increases	Material Decr.	Moderate Decr.
Forfeitures	Marginal Decr.	Marginal Decr.
End of Career Payments	Moderate Incr.	Moderate Incr.
Marriage Assumption	Marginal Decr.	Marginal Decr.
Administrative Expenses	N/A	N/A

Teachers		
Assumption	Likely Direction of Change on Employer Rate Due to Proposed	
	NC	UAAL
Rates of Age-Based Withdrawal	Moderate Decr.	Moderate Decr.
Rates of Service-Based Withdrawal	Material Decr.	Moderate Incr.
Rates of Disability	Marginal Incr.	Marginal Incr.
Rates of Age-Based Retirement	Marginal Incr.	Marginal Incr.
Rates of Age-Based Early Retirement	Moderate Decr.	Moderate Decr.
Rates of Rule-Based Early Retirement	Moderate Incr.	Moderate Incr.
Pre-Retirement Mortality	Decrease	Decrease
Post-Retirement Healthy Mortality	Moderate Decr.	Marginal Decr.
Post-Retirement Disabled Mortality	Marginal Incr.	Marginal Incr.
Merit and Longevity Salary Increases	Material Incr.	Material Incr.
Forfeitures	Marginal Decr.	Marginal Decr.
End of Career Payments	Moderate Decr.	Moderate Decr.
Marriage Assumption	Marginal Decr.	Marginal Decr.
Administrative Expenses	N/A	N/A

Group II

Police		
Assumption	Likely Direction of Change on Employer Rate Due to Proposed	
	NC	UAAL
Rates of Age-Based Withdrawal	Moderate Decr.	Moderate Decr.
Rates of Service-Based Withdrawal	Material Decr.	Moderate Incr.
Rates of Ordinary Disability	Marginal Incr.	Marginal Incr.
Rates of Duty Disability	Marginal Incr.	Marginal Incr.
Rates of Age-Based Retirement	Moderate Decr.	Moderate Decr.
Pre-Retirement Mortality	Marginal Decr.	Marginal Decr.
Post-Retirement Healthy Mortality	Moderate Incr.	Moderate Incr.
Post-Retirement Disabled Mortality	Marginal Incr.	Marginal Incr.
Merit and Longevity Salary Increases	Material Decr.	Material Decr.
Forfeitures	Marginal Decr.	Marginal Decr.
End of Career Payments	Moderate Incr.	Moderate Incr.
Marriage Assumption	No Change	No Change
Administrative Expenses	N/A	N/A

Fire		
Assumption	Likely Direction of Change on Employer Rate Due to Proposed	
	NC	UAAL
Rates of Age-Based Withdrawal	Moderate Decr.	Moderate Decr.
Rates of Service-Based Withdrawal	Material Decr.	Moderate Incr.
Rates of Ordinary Disability	Marginal Incr.	Marginal Incr.
Rates of Duty Disability	Marginal Decr.	Marginal Decr.
Rates of Age-Based Retirement	Moderate Incr.	Moderate Incr.
Pre-Retirement Mortality	Marginal Decr.	Marginal Decr.
Post-Retirement Healthy Mortality	Moderate Incr.	Moderate Incr.
Post-Retirement Disabled Mortality	Marginal Incr.	Marginal Incr.
Merit and Longevity Salary Increases	Material Decr.	Material Decr.
Forfeitures	Marginal Decr.	Marginal Decr.
End of Career Payments	Moderate Incr.	Moderate Incr.
Marriage Assumption	No Change	No Change
Administrative Expenses	N/A	N/A

Order of Magnitude
Marginal < Moderate < Material

NHRS IN TOTAL[@]
(\$ IN MILLIONS)

Demographic Assumptions Economic Assumptions	Current	Proposed				
	Current (8.5%/4.5%)	Current (8.5%/4.5%)	Alt 1 (8.5%/4.0%)	Alt 2 (8.0%/4.0%)	Alt 3 (7.75%/3.5%)	Alt 4 (7.5%/3.5%)
Employer Normal Cost	4.95%	4.26%	3.80%	4.63%	4.58%	5.06%
UAAL Payment*	<u>8.50%</u>	<u>8.80%</u>	<u>9.05%</u>	<u>9.91%</u>	<u>10.67%</u>	<u>11.12%</u>
Total Pension Contribution (Estimated 2014)	13.45%	13.06%	12.85%	14.54%	15.25%	16.18%
Employer Health Subsidy Contribution	<u>2.00%</u>	<u>1.97%</u>	<u>2.04%</u>	<u>2.04%</u>	<u>2.13%</u>	<u>2.13%</u>
Total Employer Contribution	15.45%	15.03%	14.89%	16.58%	17.38%	18.31%
Total Estimated Employer Contribution \$	\$ 456.7	\$ 444.6	\$ 432.4	\$ 481.1	\$ 494.6	\$ 520.9
Valuation Assets	\$ 5,233.8	\$ 5,233.8	\$ 5,233.8	\$ 5,233.8	\$ 5,233.8	\$ 5,233.8
Accrued Liability	<u>\$ 8,953.9</u>	<u>\$ 9,116.7</u>	<u>\$ 9,012.1</u>	<u>\$ 9,487.7</u>	<u>\$ 9,627.4</u>	<u>\$ 9,889.1</u>
UAAL	\$ (3,720.1)	\$ (3,882.9)	\$ (3,778.3)	\$ (4,253.9)	\$ (4,393.6)	\$ (4,655.3)
Funded %	58.5%	57.4%	58.1%	55.2%	54.4%	52.9%
* <i>Unfunded Actuarial Accrued Liability, financed over a 26-year period from the contribution effective date -- 7/1/2013.</i>						
Estimated Potential Change in Employer Contribution Rate for						
Investment (gains)/losses scheduled to be recognized#	0.51%	0.51%	0.53%	0.52%	0.54%	0.53%
No payroll growth from 2010 to 2011##	0.38%	0.40%	0.36%	0.40%	0.37%	0.39%

Does not include FY 2011 investment return results

Does not include liability gains that may result from pay increases that are less than assumed

@ Totals may not add due to rounding

EMPLOYEES

(\$ IN MILLIONS)

Demographic Assumptions Economic Assumptions	Current						Proposed											
	Current			Current			Alt 1			Alt 2			Alt 3			Alt 4		
	(8.5%/4.5%)			(8.5%/4.5%)			(8.5%/4.0%)			(8.0%/4.0%)			(7.75%/3.5%)			(7.5%/3.5%)		
	State	Pol. Sub.	Total	State	Pol. Sub.	Total	State	Pol. Sub.	Total	State	Pol. Sub.	Total	State	Pol. Sub.	Total	State	Pol. Sub.	Total
Employer Normal Cost	4.49%	4.49%	4.49%	3.58%	3.58%	3.58%	3.23%	3.23%	3.23%	3.87%	3.87%	3.87%	3.82%	3.82%	3.82%	4.20%	4.20%	4.20%
UAAL Payment*	<u>6.55%</u>	<u>6.55%</u>	<u>6.55%</u>	<u>6.84%</u>	<u>6.84%</u>	<u>6.84%</u>	<u>6.99%</u>	<u>6.99%</u>	<u>6.99%</u>	<u>7.64%</u>	<u>7.64%</u>	<u>7.64%</u>	<u>8.16%</u>	<u>8.16%</u>	<u>8.16%</u>	<u>8.50%</u>	<u>8.50%</u>	<u>8.50%</u>
Total Pension Contribution (Estimated 2014)	11.04%	11.04%	11.04%	10.42%	10.42%	10.42%	10.22%	10.22%	10.22%	11.51%	11.51%	11.51%	11.98%	11.98%	11.98%	12.70%	12.70%	12.70%
Employer Health Subsidy Contribution	<u>1.56%</u>	<u>0.49%</u>		<u>1.53%</u>	<u>0.52%</u>		<u>1.56%</u>	<u>0.54%</u>		<u>1.56%</u>	<u>0.55%</u>		<u>1.59%</u>	<u>0.59%</u>		<u>1.59%</u>	<u>0.59%</u>	
Total Employer Contribution	12.60%	11.53%		11.95%	10.94%		11.78%	10.76%		13.07%	12.06%		13.57%	12.57%		14.29%	13.29%	
Total Estimated Employer Contribution \$		\$ 156.9			\$ 148.9			\$ 143.8		\$ 160.4			\$ 163.7				\$ 172.7	
Valuation Assets		\$ 1,721.0			\$ 1,721.0			\$ 1,721.0			\$ 1,721.0			\$ 1,721.0			\$ 1,721.0	
Accrued Liability		<u>\$ 2,981.6</u>			<u>\$ 3,059.2</u>			<u>\$ 3,015.8</u>			<u>\$ 3,175.1</u>			<u>\$ 3,213.0</u>			<u>\$ 3,299.9</u>	
UAAL		\$ (1,260.6)			\$ (1,338.2)			\$ (1,294.8)			\$ (1,454.1)			\$ (1,492.0)			\$ (1,578.9)	
Funded %		57.7%			56.3%			57.1%			54.2%			53.6%			52.2%	

* Unfunded Actuarial Accrued Liability, financed over a 26 year period from the contribution effective date -- 7/1/2013.

Estimated Potential Change in Employer Contribution Rate for

Investment (gains)/losses scheduled to be recognized#	0.38%	0.37%	0.40%	0.38%	0.40%	0.39%
No payroll growth from 2010 to 2011##	0.29%	0.31%	0.28%	0.31%	0.29%	0.30%

Does not include FY 2011 investment return results

Does not include liability gains that may result from pay increases that are less than assumed

TEACHERS
(\$ IN MILLIONS)

Demographic Assumptions	Current	Proposed				
	Current	Current	Alt 1	Alt 2	Alt 3	Alt 4
Economic Assumptions	(8.5%/4.5%)	(8.5%/4.5%)	(8.5%/4.0%)	(8.0%/4.0%)	(7.75%/3.5%)	(7.5%/3.5%)
Employer Normal Cost	3.49%	3.41%	2.98%	3.67%	3.60%	3.99%
UAAL Payment*	<u>8.32%</u>	<u>8.56%</u>	<u>8.81%</u>	<u>9.57%</u>	<u>10.27%</u>	<u>10.67%</u>
Total Pension Contribution (Estimated 2014)	11.81%	11.97%	11.79%	13.24%	13.87%	14.66%
Employer Health Subsidy Contribution	<u>1.80%</u>	<u>1.79%</u>	<u>1.88%</u>	<u>1.87%</u>	<u>1.98%</u>	<u>1.98%</u>
Total Employer Contribution	13.61%	13.76%	13.67%	15.11%	15.85%	16.64%
Total Estimated Employer Contribution \$	\$ 165.7	\$ 167.5	\$ 163.2	\$ 180.4	\$ 185.7	\$ 194.9
Valuation Assets	\$ 2,049.7	\$ 2,049.7	\$ 2,049.7	\$ 2,049.7	\$ 2,049.7	\$ 2,049.7
Accrued Liability	<u>\$ 3,553.1</u>	<u>\$ 3,591.7</u>	<u>\$ 3,551.1</u>	<u>\$ 3,732.8</u>	<u>\$ 3,784.9</u>	<u>\$ 3,885.2</u>
UAAL	\$ (1,503.5)	\$ (1,542.0)	\$ (1,501.4)	\$ (1,683.1)	\$ (1,735.2)	\$ (1,835.5)
Funded %	57.7%	57.1%	57.7%	54.9%	54.2%	52.8%
* <i>Unfunded Actuarial Accrued Liability, financed over a 26 year period from the contribution effective date -- 7/1/2013.</i>						
Estimated Potential Change in Employer Contribution Rate for						
Investment (gains)/losses scheduled to be recognized##	0.48%	0.49%	0.51%	0.50%	0.52%	0.51%
No payroll growth from 2010 to 2011##	0.37%	0.39%	0.35%	0.38%	0.36%	0.37%

Does not include FY 2011 investment return results

Does not include liability gains that may result from pay increases that are less than assumed

POLICE
(\$ IN MILLIONS)

Demographic Assumptions Economic Assumptions	Current	Proposed				
	Current (8.5%/4.5%)	Current (8.5%/4.5%)	Alt 1 (8.5%/4.0%)	Alt 2 (8.0%/4.0%)	Alt 3 (7.75%/3.5%)	Alt 4 (7.5%/3.5%)
Employer Normal Cost	9.59%	8.06%	7.30%	8.92%	9.00%	9.91%
UAAL Payment*	<u>14.10%</u>	<u>14.75%</u>	<u>15.29%</u>	<u>17.01%</u>	<u>18.59%</u>	<u>19.49%</u>
Total Pension Contribution (Estimated 2014)	23.69%	22.81%	22.59%	25.93%	27.59%	29.40%
Employer Health Subsidy Contribution	<u>5.51%</u>	<u>5.37%</u>	<u>5.53%</u>	<u>5.53%</u>	<u>5.70%</u>	<u>5.70%</u>
Total Employer Contribution	29.20%	28.18%	28.12%	31.46%	33.29%	35.10%
Total Estimated Employer Contribution \$	\$ 90.0	\$ 86.8	\$ 85.0	\$ 95.1	\$ 98.7	\$ 104.1
Valuation Assets	\$ 997.3	\$ 997.3	\$ 997.3	\$ 997.3	\$ 997.3	\$ 997.3
Accrued Liability	<u>\$ 1,635.2</u>	<u>\$ 1,672.3</u>	<u>\$ 1,658.4</u>	<u>\$ 1,750.6</u>	<u>\$ 1,785.0</u>	<u>\$ 1,835.9</u>
UAAL	\$ (637.9)	\$ (675.0)	\$ (661.1)	\$ (753.3)	\$ (787.7)	\$ (838.6)
Funded %	61.0%	59.6%	60.1%	57.0%	55.9%	54.3%

* *Unfunded Actuarial Accrued Liability, financed over a 26 year period from the contribution effective date -- 7/1/2013.*

Estimated Potential Change in Employer Contribution Rate for

Investment (gains)/losses scheduled to be recognized#	0.94%	0.93%	0.99%	0.96%	1.01%	0.99%
No payroll growth from 2010 to 2011##	0.63%	0.66%	0.61%	0.68%	0.65%	0.68%

Does not include FY 2011 investment return results

Does not include liability gains that may result from pay increases that are less than assumed

FIRE
(\$ IN MILLIONS)

Demographic Assumptions Economic Assumptions	Current	Proposed				
	Current (8.5%/4.5%)	Current (8.5%/4.5%)	Alt 1 (8.5%/4.0%)	Alt 2 (8.0%/4.0%)	Alt 3 (7.75%/3.5%)	Alt 4 (7.5%/3.5%)
Employer Normal Cost	11.89%	9.81%	8.81%	10.76%	10.73%	11.81%
UAAL Payment*	<u>16.50%</u>	<u>16.67%</u>	<u>17.25%</u>	<u>19.12%</u>	<u>20.82%</u>	<u>21.79%</u>
Total Pension Contribution (Estimated 2014)	28.39%	26.48%	26.06%	29.88%	31.55%	33.60%
Employer Health Subsidy Contribution	<u>5.51%</u>	<u>5.37%</u>	<u>5.53%</u>	<u>5.53%</u>	<u>5.70%</u>	<u>5.70%</u>
Total Employer Contribution	33.90%	31.85%	31.59%	35.41%	37.25%	39.30%
Total Estimated Employer Contribution \$	\$ 44.1	\$ 41.4	\$ 40.3	\$ 45.2	\$ 46.6	\$ 49.2
Valuation Assets	\$ 465.9	\$ 465.9	\$ 465.9	\$ 465.9	\$ 465.9	\$ 465.9
Accrued Liability	<u>\$ 784.0</u>	<u>\$ 793.5</u>	<u>\$ 786.7</u>	<u>\$ 829.2</u>	<u>\$ 844.5</u>	<u>\$ 868.0</u>
UAAL	\$ (318.2)	\$ (327.6)	\$ (320.8)	\$ (363.3)	\$ (378.6)	\$ (402.1)
Funded %	59.4%	58.7%	59.2%	56.2%	55.2%	53.7%

* *Unfunded Actuarial Accrued Liability, financed over a 26 year period from the contribution effective date -- 7/1/2013.*

Estimated Potential Change in Employer Contribution Rate for						
Investment (gains)/losses scheduled to be recognized#	1.03%	1.01%	1.07%	1.05%	1.09%	1.08%
No payroll growth from 2010 to 2011##	0.74%	0.75%	0.69%	0.76%	0.73%	0.76%

Does not include FY 2011 investment return results

Does not include liability gains that may result from pay increases that are less than assumed

**NHRS TOTAL PENSION
UNFUNDED ACTUARIAL ACCRUED LIABILITY PAYOFF PROJECTION*
(\$ IN MILLIONS)**

**PROPOSED DEMOGRAPHIC ASSUMPTIONS AND
CURRENT ECONOMIC ASSUMPTIONS (8.5%/4.5%)**

Employer Contribution Rates								
Fiscal	Year	Total	Employer	UAAL	Projected	UAAL	UAAL	UAAL End
Year	Ending	Contribution	Normal	Payment	Payroll	Beginning	Payment	of Year
	June 30,		Cost			of Year		
	2011	10.70%	4.33%	6.37%	\$ 2,593	\$ 3,883	\$165	\$4,041
	2012	13.11%	4.31%	8.80%	2,710	4,041	238	4,136
	2013	13.09%	4.29%	8.80%	2,832	4,136	249	4,228
1	2014	13.06%	4.26%	8.80%	2,959	4,228	260	4,316
2	2015	13.04%	4.24%	8.80%	3,092	4,316	272	4,399
3	2016	13.02%	4.22%	8.80%	3,231	4,399	284	4,477
4	2017	13.00%	4.20%	8.80%	3,377	4,477	297	4,548
5	2018	12.98%	4.18%	8.80%	3,529	4,548	311	4,611
6	2019	12.96%	4.16%	8.80%	3,687	4,611	324	4,665
7	2020	12.94%	4.14%	8.80%	3,853	4,665	339	4,708
8	2021	12.92%	4.12%	8.80%	4,027	4,708	354	4,739
9	2022	12.91%	4.11%	8.80%	4,208	4,739	370	4,756
10	2023	12.89%	4.09%	8.80%	4,397	4,756	387	4,757
11	2024	12.88%	4.08%	8.80%	4,595	4,757	404	4,740
12	2025	12.86%	4.06%	8.80%	4,802	4,740	423	4,702
13	2026	12.85%	4.05%	8.80%	5,018	4,702	442	4,642
14	2027	12.84%	4.04%	8.80%	5,244	4,642	461	4,555
15	2028	12.83%	4.03%	8.80%	5,480	4,555	482	4,440
16	2029	12.82%	4.02%	8.80%	5,726	4,440	504	4,293
17	2030	12.81%	4.01%	8.80%	5,984	4,293	527	4,109
18	2031	12.81%	4.01%	8.80%	6,253	4,109	550	3,885
19	2032	12.80%	4.00%	8.80%	6,535	3,885	575	3,616
20	2033	12.79%	3.99%	8.80%	6,829	3,616	601	3,297
21	2034	12.78%	3.98%	8.80%	7,136	3,297	628	2,923
22	2035	12.78%	3.98%	8.80%	7,457	2,923	656	2,488
23	2036	12.77%	3.97%	8.80%	7,793	2,488	686	1,984
24	2037	12.77%	3.97%	8.80%	8,144	1,984	717	1,406
25	2038	12.77%	3.97%	8.80%	8,510	1,406	749	746
26	2039	12.77%	3.97%	8.80%	8,893	746	783	-

* This projection does not reflect the impact of any potential gain sharing when the funded status exceeds 85%.

**NHRS TOTAL PENSION
UNFUNDED ACTUARIAL ACCRUED LIABILITY PAYOFF PROJECTION*
(\$ IN MILLIONS)**

**PROPOSED DEMOGRAPHIC ASSUMPTIONS AND
ALTERNATE 1 ECONOMIC ASSUMPTIONS (8.5%/4.0%)**

<u>Employer Contribution Rates</u>								
Fiscal Year Ending Year June 30,	Total Contribution	Employer Normal Cost	UAAL Payment	Projected Payroll	UAAL Beginning of Year	UAAL Payment	UAAL End of Year	
2011	10.70%	3.87%	6.83%	\$ 2,581	\$ 3,778	\$176	\$3,916	
2012	13.11%	3.85%	9.26%	2,684	3,916	249	3,990	
2013	13.09%	3.83%	9.26%	2,791	3,990	258	4,059	
1 2014	12.85%	3.80%	9.05%	2,903	4,059	263	4,131	
2 2015	12.83%	3.78%	9.05%	3,019	4,131	273	4,197	
3 2016	12.81%	3.76%	9.05%	3,140	4,197	284	4,258	
4 2017	12.79%	3.74%	9.05%	3,265	4,258	296	4,312	
5 2018	12.77%	3.72%	9.05%	3,396	4,312	307	4,358	
6 2019	12.75%	3.70%	9.05%	3,532	4,358	320	4,396	
7 2020	12.73%	3.68%	9.05%	3,673	4,396	332	4,423	
8 2021	12.71%	3.66%	9.05%	3,820	4,423	346	4,439	
9 2022	12.70%	3.65%	9.05%	3,973	4,439	360	4,442	
10 2023	12.68%	3.63%	9.05%	4,132	4,442	374	4,430	
11 2024	12.67%	3.62%	9.05%	4,297	4,430	389	4,401	
12 2025	12.65%	3.60%	9.05%	4,469	4,401	404	4,354	
13 2026	12.64%	3.59%	9.05%	4,647	4,354	421	4,285	
14 2027	12.63%	3.58%	9.05%	4,833	4,285	437	4,194	
15 2028	12.62%	3.57%	9.05%	5,027	4,194	455	4,076	
16 2029	12.61%	3.56%	9.05%	5,228	4,076	473	3,930	
17 2030	12.60%	3.55%	9.05%	5,437	3,930	492	3,751	
18 2031	12.60%	3.55%	9.05%	5,654	3,751	512	3,537	
19 2032	12.59%	3.54%	9.05%	5,880	3,537	532	3,283	
20 2033	12.58%	3.53%	9.05%	6,116	3,283	553	2,986	
21 2034	12.57%	3.52%	9.05%	6,360	2,986	576	2,640	
22 2035	12.57%	3.52%	9.05%	6,615	2,640	599	2,240	
23 2036	12.56%	3.51%	9.05%	6,879	2,240	623	1,782	
24 2037	12.56%	3.51%	9.05%	7,154	1,782	647	1,259	
25 2038	12.56%	3.51%	9.05%	7,441	1,259	673	664	
26 2039	12.56%	3.51%	9.05%	7,738	664	700	-	

* This projection does not reflect the impact of any potential gain sharing when the funded status exceeds 85%.

**NHRS TOTAL PENSION
UNFUNDED ACTUARIAL ACCRUED LIABILITY PAYOFF PROJECTION*
(\$ IN MILLIONS)**

**PROPOSED DEMOGRAPHIC ASSUMPTIONS AND
ALTERNATE 2 ECONOMIC ASSUMPTIONS (8.0%/4.0%)**

Employer Contribution Rates								
Fiscal	Year	Total	Employer	UAAL	Projected	UAAL	UAAL	UAAL End
Year	Ending	Contribution	Normal	Payment	Payroll	Beginning	Payment	of Year
Year	June 30,		Cost			of Year		of Year
	2011	10.70%	4.70%	6.00%	\$ 2,581	\$ 4,254	\$155	\$4,433
	2012	13.11%	4.68%	8.43%	2,684	4,433	226	4,553
	2013	13.09%	4.66%	8.43%	2,791	4,553	235	4,672
1	2014	14.54%	4.63%	9.91%	2,903	4,672	288	4,747
2	2015	14.52%	4.61%	9.91%	3,019	4,747	299	4,816
3	2016	14.50%	4.59%	9.91%	3,140	4,816	311	4,878
4	2017	14.48%	4.57%	9.91%	3,265	4,878	324	4,932
5	2018	14.46%	4.55%	9.91%	3,396	4,932	337	4,976
6	2019	14.44%	4.53%	9.91%	3,532	4,976	350	5,011
7	2020	14.42%	4.51%	9.91%	3,673	5,011	364	5,033
8	2021	14.40%	4.49%	9.91%	3,820	5,033	379	5,042
9	2022	14.39%	4.48%	9.91%	3,973	5,042	394	5,036
10	2023	14.37%	4.46%	9.91%	4,132	5,036	409	5,014
11	2024	14.36%	4.45%	9.91%	4,297	5,014	426	4,972
12	2025	14.34%	4.43%	9.91%	4,469	4,972	443	4,910
13	2026	14.33%	4.42%	9.91%	4,647	4,910	461	4,824
14	2027	14.32%	4.41%	9.91%	4,833	4,824	479	4,712
15	2028	14.31%	4.40%	9.91%	5,027	4,712	498	4,571
16	2029	14.30%	4.39%	9.91%	5,228	4,571	518	4,398
17	2030	14.29%	4.38%	9.91%	5,437	4,398	539	4,190
18	2031	14.29%	4.38%	9.91%	5,654	4,190	560	3,942
19	2032	14.28%	4.37%	9.91%	5,880	3,942	583	3,652
20	2033	14.27%	4.36%	9.91%	6,116	3,652	606	3,314
21	2034	14.26%	4.35%	9.91%	6,360	3,314	630	2,924
22	2035	14.26%	4.35%	9.91%	6,615	2,924	656	2,477
23	2036	14.25%	4.34%	9.91%	6,879	2,477	682	1,966
24	2037	14.25%	4.34%	9.91%	7,154	1,966	709	1,386
25	2038	14.25%	4.34%	9.91%	7,441	1,386	737	731
26	2039	14.25%	4.34%	9.91%	7,738	731	767	-

* This projection does not reflect the impact of any potential gain sharing when the funded status exceeds 85%.

**NHRS TOTAL PENSION
UNFUNDED ACTUARIAL ACCRUED LIABILITY PAYOFF PROJECTION*
(\$ IN MILLIONS)**

**PROPOSED DEMOGRAPHIC ASSUMPTIONS AND
ALTERNATE 3 ECONOMIC ASSUMPTIONS (7.75%/3.5%)**

<u>Employer Contribution Rates</u>								
Fiscal Year Ending Year	June 30,	Total Contribution	Employer Normal Cost	UAAL Payment	Projected Payroll	UAAL Beginning of Year	UAAL Payment	UAAL End of Year
	2011	10.70%	4.65%	6.05%	\$ 2,568	\$ 4,394	\$155	\$4,573
	2012	13.11%	4.63%	8.48%	2,658	4,573	225	4,693
	2013	13.09%	4.61%	8.48%	2,751	4,693	233	4,815
1	2014	15.25%	4.58%	10.67%	2,847	4,815	304	4,872
2	2015	15.23%	4.56%	10.67%	2,947	4,872	314	4,923
3	2016	15.21%	4.54%	10.67%	3,050	4,923	325	4,967
4	2017	15.19%	4.52%	10.67%	3,157	4,967	337	5,002
5	2018	15.17%	4.50%	10.67%	3,267	5,002	349	5,028
6	2019	15.15%	4.48%	10.67%	3,382	5,028	361	5,043
7	2020	15.13%	4.46%	10.67%	3,500	5,043	373	5,046
8	2021	15.11%	4.44%	10.67%	3,623	5,046	387	5,036
9	2022	15.10%	4.43%	10.67%	3,749	5,036	400	5,011
10	2023	15.08%	4.41%	10.67%	3,881	5,011	414	4,969
11	2024	15.07%	4.40%	10.67%	4,016	4,969	429	4,909
12	2025	15.05%	4.38%	10.67%	4,157	4,909	444	4,829
13	2026	15.04%	4.37%	10.67%	4,303	4,829	459	4,727
14	2027	15.03%	4.36%	10.67%	4,453	4,727	475	4,600
15	2028	15.02%	4.35%	10.67%	4,609	4,600	492	4,446
16	2029	15.01%	4.34%	10.67%	4,770	4,446	509	4,262
17	2030	15.00%	4.33%	10.67%	4,937	4,262	527	4,045
18	2031	15.00%	4.33%	10.67%	5,110	4,045	545	3,793
19	2032	14.99%	4.32%	10.67%	5,289	3,793	564	3,501
20	2033	14.98%	4.31%	10.67%	5,474	3,501	584	3,165
21	2034	14.97%	4.30%	10.67%	5,666	3,165	605	2,783
22	2035	14.97%	4.30%	10.67%	5,864	2,783	626	2,349
23	2036	14.96%	4.29%	10.67%	6,069	2,349	648	1,859
24	2037	14.96%	4.29%	10.67%	6,282	1,859	670	1,307
25	2038	14.96%	4.29%	10.67%	6,501	1,307	694	688
26	2039	14.96%	4.29%	10.67%	6,729	688	718	-

* This projection does not reflect the impact of any potential gain sharing when the funded status exceeds 85%.

**NHRS TOTAL PENSION
UNFUNDED ACTUARIAL ACCRUED LIABILITY PAYOFF PROJECTION*
(\$ IN MILLIONS)**

**PROPOSED DEMOGRAPHIC ASSUMPTIONS AND
ALTERNATE 4 ECONOMIC ASSUMPTIONS (7.50%/3.5%)**

<u>Employer Contribution Rates</u>								
Fiscal Year Ending Year June 30,	Total Contribution	Employer Normal Cost	UAAL Payment	Projected Payroll	UAAL Beginning of Year	UAAL Payment	UAAL End of Year	
2011	10.70%	5.13%	5.57%	\$ 2,568	\$ 4,655	\$143	\$4,856	
2012	13.11%	5.11%	8.00%	2,658	4,856	213	5,000	
2013	13.09%	5.09%	8.00%	2,751	5,000	220	5,146	
1 2014	16.18%	5.06%	11.12%	2,847	5,146	317	5,204	
2 2015	16.16%	5.04%	11.12%	2,947	5,204	328	5,255	
3 2016	16.14%	5.02%	11.12%	3,050	5,255	339	5,297	
4 2017	16.12%	5.00%	11.12%	3,157	5,297	351	5,330	
5 2018	16.10%	4.98%	11.12%	3,267	5,330	363	5,353	
6 2019	16.08%	4.96%	11.12%	3,382	5,353	376	5,365	
7 2020	16.06%	4.94%	11.12%	3,500	5,365	389	5,363	
8 2021	16.04%	4.92%	11.12%	3,623	5,363	403	5,348	
9 2022	16.03%	4.91%	11.12%	3,749	5,348	417	5,316	
10 2023	16.01%	4.89%	11.12%	3,881	5,316	432	5,268	
11 2024	16.00%	4.88%	11.12%	4,016	5,268	447	5,200	
12 2025	15.98%	4.86%	11.12%	4,157	5,200	462	5,110	
13 2026	15.97%	4.85%	11.12%	4,303	5,110	478	4,997	
14 2027	15.96%	4.84%	11.12%	4,453	4,997	495	4,859	
15 2028	15.95%	4.83%	11.12%	4,609	4,859	513	4,691	
16 2029	15.94%	4.82%	11.12%	4,770	4,691	530	4,493	
17 2030	15.93%	4.81%	11.12%	4,937	4,493	549	4,261	
18 2031	15.93%	4.81%	11.12%	5,110	4,261	568	3,991	
19 2032	15.92%	4.80%	11.12%	5,289	3,991	588	3,680	
20 2033	15.91%	4.79%	11.12%	5,474	3,680	609	3,325	
21 2034	15.90%	4.78%	11.12%	5,666	3,325	630	2,921	
22 2035	15.90%	4.78%	11.12%	5,864	2,921	652	2,464	
23 2036	15.89%	4.77%	11.12%	6,069	2,464	675	1,949	
24 2037	15.89%	4.77%	11.12%	6,282	1,949	699	1,371	
25 2038	15.89%	4.77%	11.12%	6,501	1,371	723	724	
26 2039	15.89%	4.77%	11.12%	6,729	724	748	2	

* This projection does not reflect the impact of any potential gain sharing when the funded status exceeds 85%.

SECTION C

AGGREGATE ECONOMIC ACTIVITY

INVESTMENT RETURN AND INFLATION ASSUMPTIONS

Background

Economic assumptions studied in this report include:

- 1) Rates of Investment Return;
- 2) Rates of Wage Inflation;
- 3) Rates of Price Inflation;
- 4) Merit & Longevity Pay Increases; and
- 5) End of Career Payments.

The first two assumptions are studied for NHRS in total (or in aggregate) are referred to in the balance of this report as the aggregate economic assumptions. The last three are studied by employee group (Employees, Teachers, Police and Fire) and are referred to in the balance of this report as the group-specific economic assumptions. The group-specific economic assumptions recommendations can be reviewed, in part, by analyzing experience contained in the member data and are discussed with the demographic assumptions (which are reviewed in a similar manner). The member data does not contain the information needed to review the aggregate economic assumptions and therefore they are studied in a different manner.

Although this report covers the period from 2005 through 2010, market experience during that time was extremely volatile. We do not believe that the past five year period is indicative of long term future asset performance. Therefore, it is instructive to consider both a longer historical perspective and a theoretical look forward. It is also useful to evaluate the current aggregate economic assumptions against other public retirement systems.

In a defined benefit retirement system such as NHRS, there are normally three major sources of funding: employer contributions, member contributions, and investment income. As part of the valuation process the actuary makes assumptions regarding the timing, amounts, and duration of benefits which will be paid out of the system. These assumptions will be discussed in detail later in this report. Once the demographic assumptions have been made, the liability associated with the benefits expected to be paid is allocated among the various sources of funding.

The larger the share of benefits that can be provided from investment income the smaller the required employer contribution. The assumed return on investments determines the portion of benefits that is expected to be provided by investment income and hence has a major impact on the computed employer contribution.

Current Investment Return and Inflation Assumptions (Aggregate Economic Assumptions)

The current aggregate economic assumptions include an 8.5% annual investment return (net of investment expenses) and an expected 4.5% annual wage inflation rate, used to project across-the-board annual pay increases (merit and seniority increases are additional). This implies a *wage* inflation adjusted real rate of return, or “spread”, of 4.0%.

Although price inflation is not explicitly assumed for valuation purposes (it is not needed as benefits are not based on price inflation), the 4.5% annual wage inflation rate would correspond to a price inflation rate of between 3.0% and 4.0%. Considering a 3.5% annual price inflation rate, the 8.5% annual investment return implies a 5.0% *price* inflation adjusted real rate of return.

INVESTMENT RETURN AND INFLATION ASSUMPTIONS

Actuarial Standards and Methodology

The selection of economic assumptions for valuation purposes is covered under Actuarial Standard of Practice No. 27 (ASOP 27). Economic assumptions are required by this standard to fall within a best-estimate range, loosely defined as the narrowest range within which the actuary reasonably anticipates the actual results will fall.

One of the methods for determining a best-estimate range for the aggregate economic assumptions is the so-called building block approach. Under this method an expected future investment return range is calculated separately for each asset class, such as fixed-income investments or equity. Then a weighted average return range is calculated based on the asset allocation of the fund. Adjustments to the best estimate return range may be made to reflect factors such as reinvestment risk, manager performance, investment expenses and administrative expenses. General price inflation is factored into the estimate.

The Historical Perspective

Using the building block methodology, NHRS' approximate asset allocation, and 20 years of historical standard stock and bond index returns (see page C-5), we developed a best estimate range of the price adjusted real rate of return of 3.3% to 7.1%. With an assumed annual price inflation rate of 3.0% and allowing a margin for conservatism, we observe that the 8.5% investment return assumption used in the valuation lies within the best estimate range, but it is more aggressive than the mean return of 8.0%. An assumed 8.0% investment return assumption is also reasonable and complies with applicable Actuarial Standards of Practice.

Historically, wage inflation as measured by national average earnings has exceeded price inflation by roughly 0.5% to 1.0% annually. With an assumed price inflation rate of 3.0% annually, we obtain a range for wage inflation rate of 3.5% to 4.0% annually, which is lower than the current NHRS assumption. In addition to looking at increases in national average earnings over the last 20 years, we looked at NHRS experience for average pay growth over the last 5 years. NHRS experience suggests a wage inflation assumption higher than 4.0% may be supportable, but we observe that the increases in average pay dropped sharply in 2009-2010. We suggest lowering the current 4.5% wage inflation assumption at this time.

	Increase in Average Pay				
	Employees	Teachers	Police	Fire	Total
2005-2006	5.2%	2.0%	7.4%	5.9%	3.7%
2006-2007	1.6%	6.1%	5.3%	1.7%	4.1%
2007-2008	7.1%	3.6%	3.0%	-3.6%	4.8%
2008-2009	7.5%	3.7%	5.9%	10.2%	6.0%
2009-2010	2.7%	2.3%	2.3%	1.7%	2.5%
2005-2010	4.8%	3.5%	4.8%	3.1%	4.2%

The building block approach is shown in detail on page C-5.

INVESTMENT RETURN AND INFLATION ASSUMPTIONS

A Forward Theoretical Look

Based on the experience of FY 2007-2008 and FY 2008-2009, many observers suggest that “everything has changed; historical returns are no longer relevant”. It is useful to use updated forecasts of investment returns as provided by NEPC and apply them to the NHRS portfolio. The results are shown on pages C-7 through C-10.

This look forward is slightly less optimistic than the historical returns. After reflecting the adjustments to the real return range from page C-5, this look forward would support a reduction of the assumed rate of investment return to around 7.5%.

Comparison with Similar Plans

The 2010 Public Fund Survey, sponsored by the National Association of State Retirement Administrators and the National Council on Teacher Retirement surveys 101 mostly statewide retirement systems. The median investment return assumption is 8%, and the median inflation assumption is 3.5%. The survey does not distinguish between price inflation and wage inflation. However, the NHRS 8.5% investment return assumption is at the high end of the range of responses, moreover the number of plans at 8.5% has decreased in the last few years.

Conclusion

It is somewhat difficult to justify the current aggregate economic assumptions based on actuarial standards and comparison with public retirement plans nationwide. Therefore, we recommend that the assumed rate of investment return be lowered to 7.5%-8.0%, net of investment expenses and the wage inflation assumption be lowered to 3.5% to 4.0% based on a price inflation assumption of 3.0%.

The actuary has no special skill at forecasting future economic conditions (the actuary does have special skills for projecting demographic conditions). With the aggregate economic assumptions there is always a range of reasonableness. We believe the proposed assumptions fall within that range.

Other Considerations

Since the dramatic market downturn of FY 2007-2008 and FY 2008-2009, the industry press has been full of discussions concerning whether the long term past is a reasonable indicator as to what the future holds. Has something changed, something that will persist and make the next 50 years look materially different from the past 50 years?

INVESTMENT RETURN AND INFLATION ASSUMPTIONS

Numerous writers and speakers suggest that balanced pension plan portfolios will not be able to achieve long range returns as high as 8% annually, without taking on undue risk. Many financial economists suggest that pension plans should only invest in bonds, because the liability (future benefit streams) is like a bond.

We are of the opinion that it is too soon to tell if the environment has changed. Since NHRS reviews assumptions every 5 years, we believe modest periodic changes in assumptions will allow NHRS to increase the health of the fund without over-burdening the current tax base.

Recommendation

We recommend lowering the investment return assumption to a point in the range of 7.5% to 8.0% net of investment expenses. We recommend lowering the wage inflation assumption to a point in the range of 3.5% to 4.0%. We recommend lowering the price inflation to 3.0%. The specific aggregate economic scenarios we have studied are:

	<u>Alternate 1</u>	<u>Alternate 2</u>	<u>Alternate 3</u>	<u>Alternate 4</u>
Investment Return	8.50%	8.00%	7.75%	7.50%
Wage Inflation	4.00%	4.00%	3.50%	3.50%
Price Inflation	3.00%	3.00%	3.00%	3.00%

Other Pay Increases

Although merit & longevity increases and end of career payments are technically economic assumptions, they are included with the demographic assumptions since they are studied separately for each member group.

WORKSHEET FOR SELECTING ECONOMIC ASSUMPTIONS

A BACKWARD LOOK

Looking at historical market experience over the last 20 years gives some indication of a reasonable range for the rate of investment return and inflation assumptions. The results on this page are backward looking only. The final assumptions should be based on a backward looking analysis and a forward looking analysis.

Worksheet for Selecting Economic Assumptions Based on ASOP No. 27 - Section 3.6

<u>Input Items</u>	<u>Illustration</u>	
Historical period for market indices	20 years (1990-2009)	
Fund investment mix (approximate) and related indices		
Common stock (S&P 500)	70%	
Corporate bonds (Salomon Bros. Long Term Corp. Bond Index)	15%	
Government bonds	15%	
Total	100%	
Price inflation (CPI from GRSindex program)	2.7%	
Wage inflation (National Average Earnings from GRSindex program)	3.8%	
<hr/>		
<u>Net Investment Return</u>	<u>Nominal</u>	<u>Real</u> (Nom.-CPI)
Nominal returns by asset class (from GRSindex)		
Common stock	8.2%	5.4%
Corporate bonds	8.0%	5.2%
Government bonds	8.2%	5.4%
Weighted average	8.8%	5.9%
Best estimate range of real returns (=real +/- stand deviation adjustment)		
Common stock	2.5%	to 8.3%
Corporate bonds	4.0%	to 6.4%
Government bonds	3.7%	to 7.1%
Weighted average	3.6%	to 7.9%
Adjustments for investment expenses*	-0.4%	
Net real return range	3.2%	to 7.5%
Expected net real return (Mid-point of real return range)	5.4%	
Price inflation range (=historical +/- .5%)	2.2%	to 3.2%
Assumed price inflation (single point within range)**	3.0%	
Nominal expected net investment return	8.4%	
Margin to increase each year's probability of success above 50%	0.1%	
Assumed net investment return	8.2%	
<hr/>		
<u>Salary scale base (excluding merit & seniority)</u>		
Historical real (productivity) wage increases	1.1%	
Range (=real +/- .7%)	0.4%	to 1.8%
Assumed productivity	0.5%	
Total pay base	3.5%	

* Administrative expenses are accounted for in the Normal Cost.

** The single point may be anywhere within the range. The choice is at the low end of the range to reflect the current low inflation environment.

A BACKWARD LOOK
HISTORICAL ANNUALIZED RATES OF RETURN
20 YEAR PERIOD ENDING DECEMBER 31, 2009

<u>Index</u>	<u>Nominal Rate</u>	<u>Real Return Adjusted for</u>		<u>Nominal Standard Deviation</u>
		<u>Price Inflation</u>	<u>Wage Inflation</u>	
Common Stock (S&P 500)	8.2%	5.4%	4.2%	19.2%
Corporate Bonds (Long Aa)	8.0%	5.2%	4.0%	7.8%
Government Bonds (20 Year)	8.2%	5.4%	4.2%	11.7%
U.S. Treasury Bills	3.8%	1.1%	0.0%	1.9%
Sample Portfolio*	8.8%	5.9%	4.8%	13.5%
Consumer Price Index	2.7%			
National Average Earnings	3.8%			

***Sample Portfolio Consists of:**
70% Common Stock
15% Corporate Bonds
15% Government Bonds
0% Treasury Bills

Sources of data used in computations:

- Returns on Common Stock, Corporate Bonds, Government Bonds and U.S. Treasury Bills are based on information presented by Ibbotson Associates in their publication "Stocks, Bonds, Bills and Inflation". Specific index information follows:

Common Stock: 1957- Present --- Total return on the S&P 500
Prior to 1957 --- Total return on the S&P 90

Corporate Bonds: Total return on Salomon Brothers long-term
High Grade Corporate Bond Index (maturity of 20 years)

Government Bonds: Total return on long-term U.S. Government Bonds
(Maturity of approximately 20 years)

Treasury Bills: Total return on 30 day T-Bills

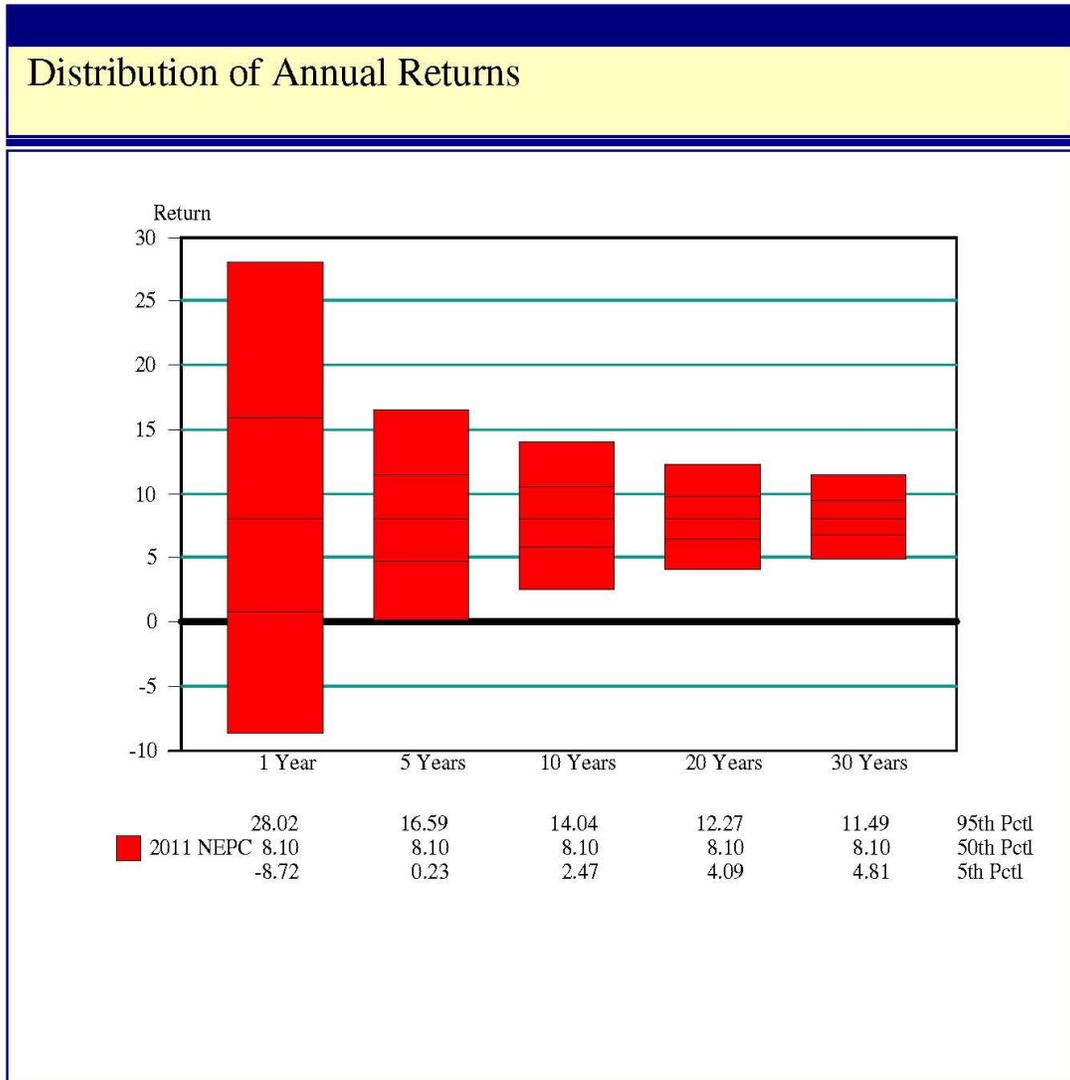
It should be noted that market index returns do not reflect investment related expenses (management fees and commissions). Those expenses typically range from 0.2% to 1.0% of assets. The net real rate of return for a retirement system which pays its own investment expenses would be correspondingly lower. If non-investment related administrative expenses are presumed to be paid out of investment earnings, the net real rate of return is further lowered.

- Consumer Price Index information is from data published by the U.S. Bureau of Labor Statistics. The United States average for all urban consumers (CPI-U) is used to calculate the results above.
- National Average Earnings information is from data published by the Social Security Administration.

INVESTMENT RETURN – A FORWARD THEORETICAL LOOK

In addition to the backward look based on historical data, the forward looking model takes into account current market conditions and future expectations.

The NHRS June 30, 2010 target portfolio was analyzed to estimate future investment returns. The underlying assumptions for these distributions are based on information provided by the NHRS Investments Staff and NEPC. The assumptions underlying the charts are included at the end of the report.

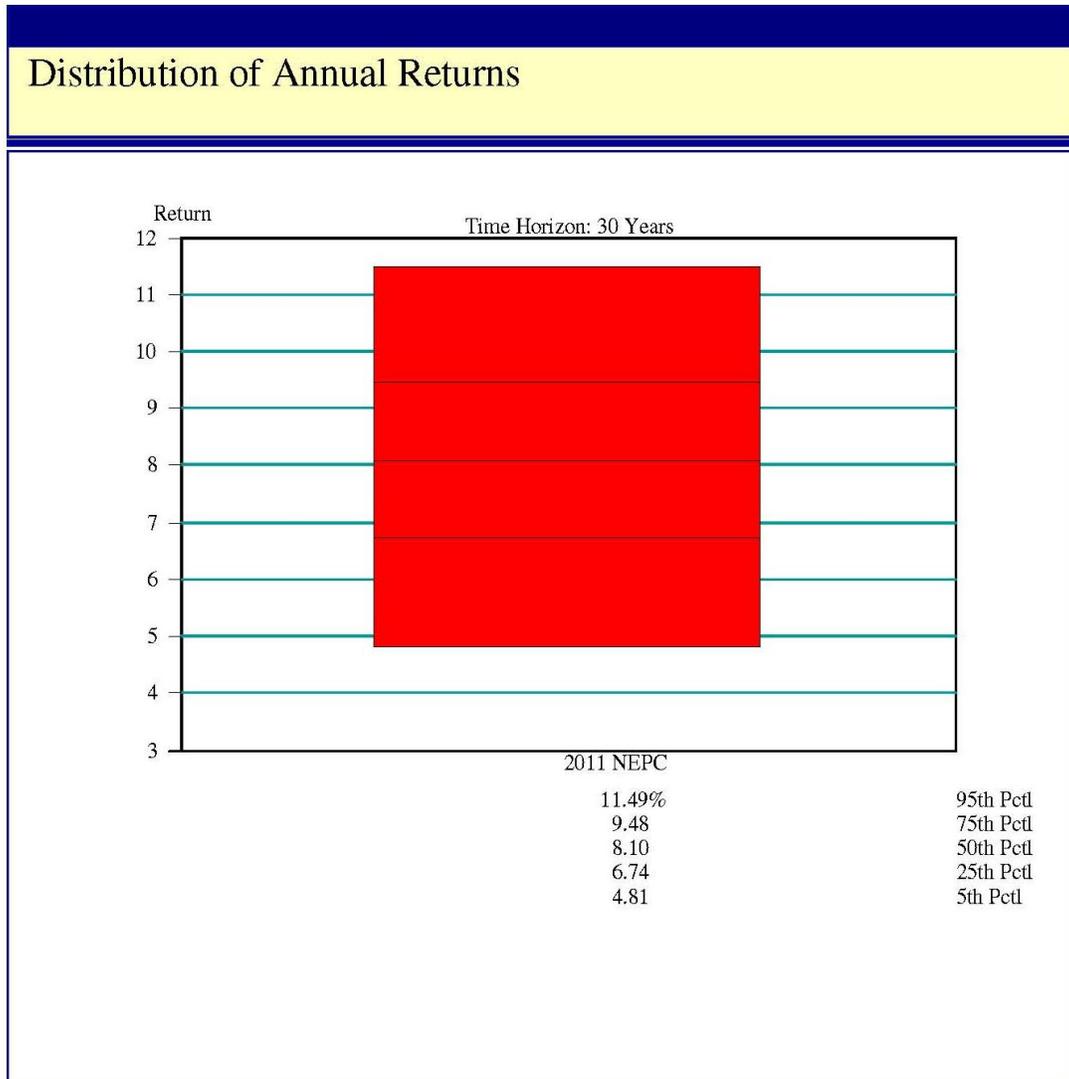


** Charts on pages C-7 through C-9 were created with Sungard's Frontier Investment Plus Version 8.1.

Rates of return in this chart are gross of investment expenses.

INVESTMENT RETURN – A FORWARD THEORETICAL LOOK

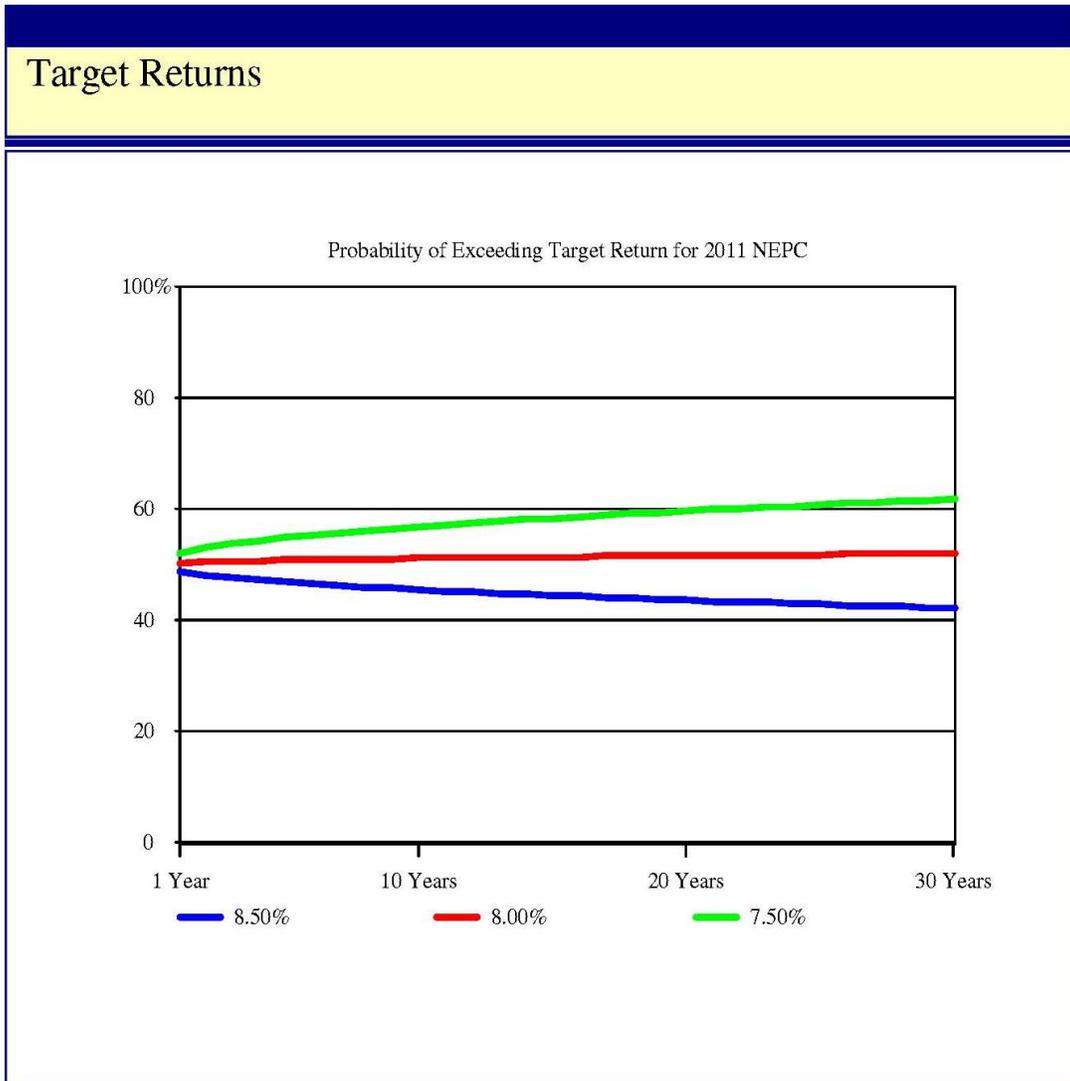
The “best estimate range” is between the 25th and 75th percentile. In the target portfolio for a 30-year investment horizon, any investment return assumption between 6.74% and 9.48% (gross) meets the actuarial standards of practice.



Rates of return in this chart are gross of investment expenses.

INVESTMENT RETURN – A FORWARD THEORETICAL LOOK

Any investment return assumption between 7.5% and 8.0% has a long term probability of achievement between roughly 40% and 60%.



Rates of return in this chart are gross of investment expenses.

INVESTMENT RETURN – A FORWARD THEORETICAL LOOK

2011 NEPC Expectations

	<u>Allocation</u>
Domestic Equity	30%
International Equity	20%
Fixed Income	30%
Real Estate	10%
Alternative Investments	10%
Expected 5-7 Year Return	6.4%
Expected 5-7 Year Standard Deviation	11.2%
Expected 30 Year Return	8.1%
Expected 30 Year Standard Deviation	11.2%

**ACTIVE DECREMENT ACTIVITY AND PAY
INCREASES (OTHER THAN WAGE INFLATION)
ACTUAL VS. EXPECTED**

SECTION D

EMPLOYEES

EMPLOYEES

MALE WITHDRAWAL EXPERIENCE

A withdrawal is a separation from active member status for a reason other than disability, death or retirement and may be either vested or non-vested.

Summary of Age-Based Withdrawal Experience With 5 or More Years of Service

Age	Withdrawals	Exposure	Crude Rates	Sample Rates*		Expected Withdrawals**	
				Old	New	Old	New
Under 20	-	-	N/A	0.0820	0.0500	-	-
20-24	-	20	0.0000	0.0760	0.0500	1.5	1.0
25-29	30	570	0.0526	0.0680	0.0500	38.5	28.5
30-34	98	1,352	0.0725	0.0610	0.0500	82.0	67.6
35-39	144	2,702	0.0533	0.0510	0.0500	136.8	135.1
40-44	201	3,992	0.0504	0.0430	0.0500	172.2	199.6
45-49	227	4,718	0.0481	0.0380	0.0500	181.2	235.9
50-54	258	1,797	0.1436	0.0330	0.0500	61.8	89.9
55-59	203	1,624	0.1250	0.0260	0.0500	44.9	81.2
Totals	1,161	16,775	0.0692	0.0429	0.0500	718.9	838.8
Ref				949	142		

Summary of Service-Based Withdrawal Experience With Less Than 5 Years of Service

Service Index	Withdrawals	Exposure	Crude Rates	Sample Rates		Expected Withdrawals**	
				Old [#]	New	Old	New
1	1,070	3,199	0.3345	0.1004	0.3000	321.3	959.7
2	1,173	5,299	0.2214	0.0992	0.2200	525.9	1,165.8
3	636	4,015	0.1584	0.0483	0.1600	193.8	642.4
4	410	3,231	0.1269	0.0461	0.1200	149.0	387.7
5	311	2,829	0.1099	0.0450	0.0800	127.3	226.3
Totals	3,600	18,573	0.1938	0.0709	0.1821	1,317.3	3,381.9
Ref				1	36		

* Sample rates are taken from midpoint of age group.

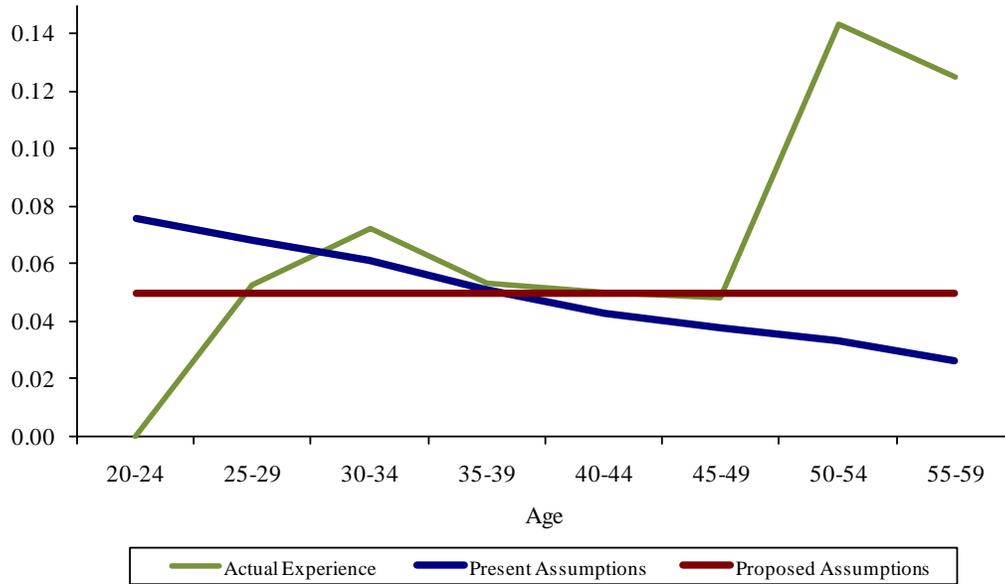
** "Expected withdrawals - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected withdrawals - Old" is the sum of actual probabilities applied in the valuation.

Based on expected withdrawals developed from valuation divided by exposure.

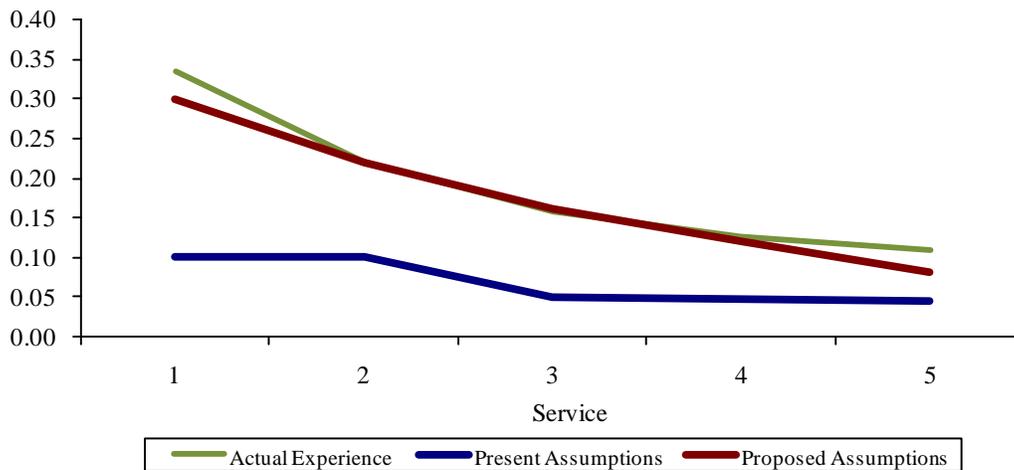
EMPLOYEES

MALE WITHDRAWAL GRAPHS

*Age-Based Withdrawal Experience
With 5 or More Years of Service*



*Service-Based Withdrawal Experience
With Less Than 5 Years of Service*



EMPLOYEES FEMALE WITHDRAWAL EXPERIENCE

A withdrawal is a separation from active member status for a reason other than disability, death or retirement and may be either vested or non-vested.

Summary of Age-Based Withdrawal Experience With 5 or More Years of Service

Age	Withdrawals	Exposure	Crude Rates	Sample Rates*		Expected Withdrawals**	
				Old	New	Old	New
Under 20	-	-	N\A	0.1350	0.0800	-	-
20-24	2	23	0.0870	0.1025	0.0800	2.0	1.8
25-29	57	707	0.0806	0.0760	0.0800	52.6	56.6
30-34	135	1,743	0.0775	0.0660	0.0620	114.4	112.0
35-39	183	3,464	0.0528	0.0560	0.0560	192.8	194.0
40-44	296	5,810	0.0509	0.0460	0.0560	265.4	325.4
45-49	389	7,746	0.0502	0.0380	0.0520	296.1	398.6
50-54	406	3,782	0.1074	0.0330	0.0400	128.7	156.1
55-59	284	2,863	0.0992	0.0280	0.0400	83.8	114.5
Totals	1,752	26,138	0.0670	0.0435	0.0520	1,135.8	1,359.0
Ref				950	256		

Summary of Service-Based Withdrawal Experience With Less Than 5 Years of Service

Service Index	Withdrawals	Exposure	Crude Rates	Sample Rates		Expected Withdrawals**	
				Old [#]	New	Old	New
1	1,668	5,116	0.3260	0.1171	0.3000	599.0	1,534.8
2	2,371	10,214	0.2321	0.1096	0.2200	1,119.5	2,247.1
3	1,226	7,450	0.1646	0.0508	0.1600	378.2	1,192.0
4	837	6,056	0.1382	0.0477	0.1200	289.0	726.7
5	543	5,202	0.1044	0.0458	0.0800	238.0	416.2
Totals	6,645	34,038	0.1952	0.0771	0.1797	2,623.7	6,116.8
Ref				1	36		

* Sample rates are taken from midpoint of age group.

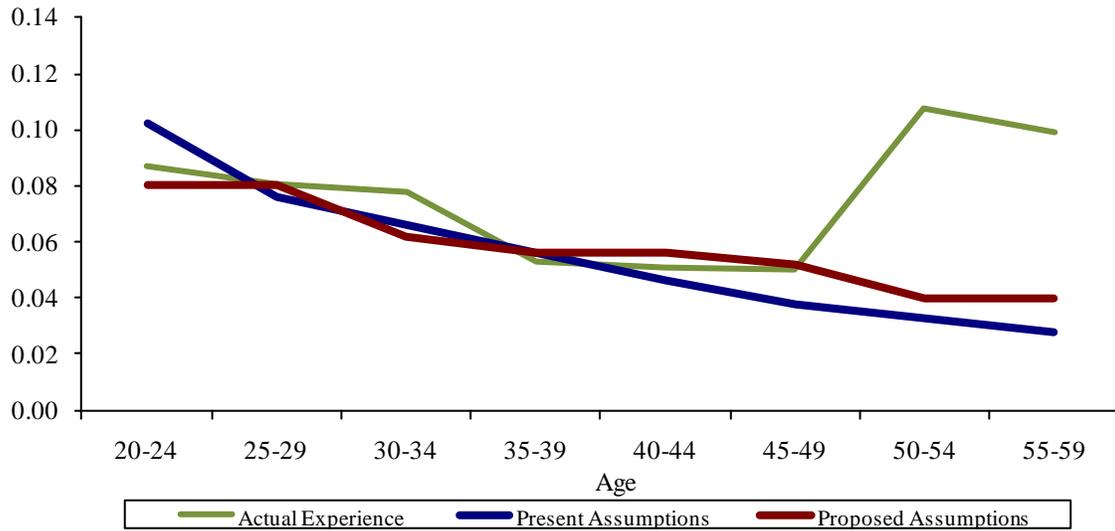
** "Expected withdrawals - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected withdrawals - Old" is the sum of actual probabilities applied in the valuation.

Based on expected withdrawals developed from valuation divided by exposure.

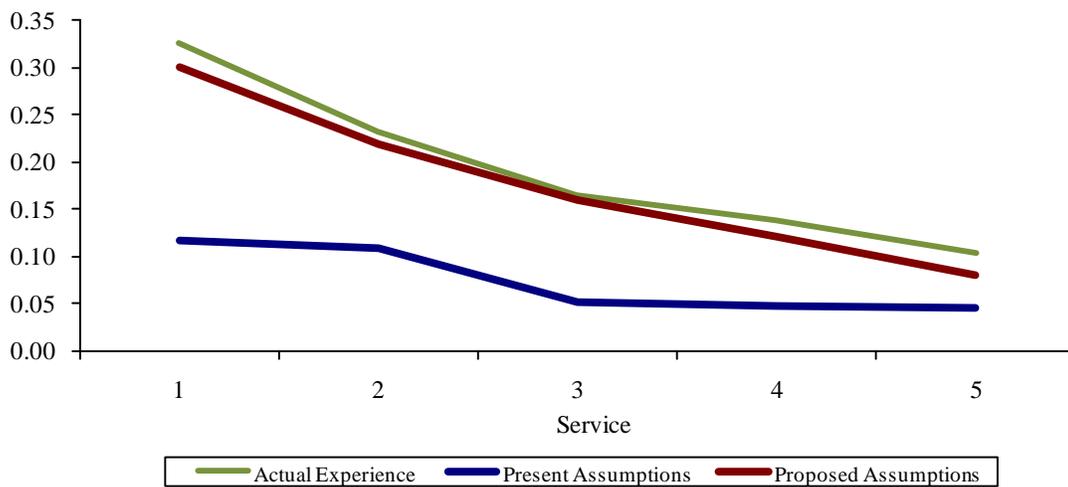
EMPLOYEES

FEMALE WITHDRAWAL GRAPHS

*Age-Based Withdrawal Experience
With 5 or More Years of Service*



*Service-Based Withdrawal Experience
With Less Than 5 Years of Service*



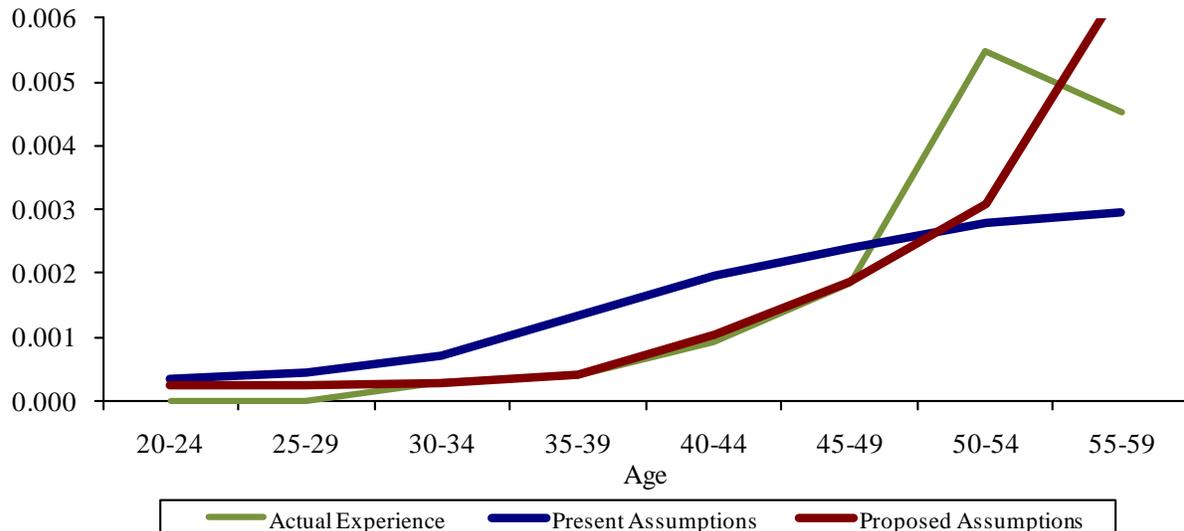
EMPLOYEES MALE DISABILITY EXPERIENCE

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 20	-	22	0.0000	0.0003	0.0002	0.0	-
20-24	-	1,472	0.0000	0.0003	0.0002	0.5	0.3
25-29	-	3,148	0.0000	0.0004	0.0002	1.4	0.7
30-34	1	3,347	0.0003	0.0007	0.0003	2.3	0.9
35-39	2	4,944	0.0004	0.0013	0.0004	6.5	2.3
40-44	6	6,502	0.0009	0.0020	0.0010	12.7	6.8
45-49	14	7,571	0.0018	0.0024	0.0019	18.2	14.1
50-54	24	4,379	0.0055	0.0028	0.0031	12.2	13.6
55-59	18	3,963	0.0045	0.0029	0.0065	11.7	26.0
Totals	65	35,348	0.0018	0.0019	0.0018	65.5	64.7
Ref				489	7		

* Sample rates are taken from midpoint of age group.

** "Expected disabilities - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Old" is the sum of actual probabilities applied in the valuation.

Male Age-Based Disability Experience



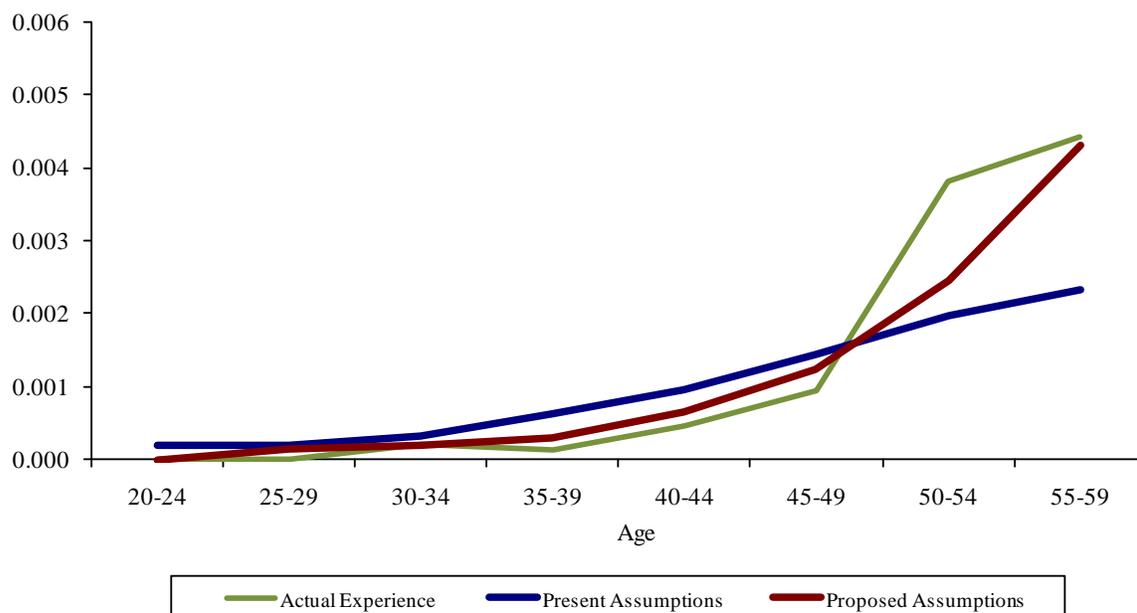
EMPLOYEES FEMALE DISABILITY EXPERIENCE

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 20	-	62	0.0000	0.0002	0.0000	0.0	-
20-24	-	2,312	0.0000	0.0002	0.0000	0.5	-
25-29	-	5,156	0.0000	0.0002	0.0001	1.0	0.8
30-34	1	5,214	0.0002	0.0003	0.0002	1.7	1.0
35-39	1	7,485	0.0001	0.0006	0.0003	4.6	2.3
40-44	5	11,039	0.0005	0.0010	0.0006	10.6	7.3
45-49	13	13,717	0.0009	0.0014	0.0012	19.8	17.2
50-54	34	8,879	0.0038	0.0020	0.0024	17.4	21.7
55-59	28	6,312	0.0044	0.0023	0.0043	14.6	27.0
Totals	82	60,176	0.0014	0.0012	0.0013	70.2	77.3
Ref				490	19		

* Sample rates are taken from midpoint of age group.

** "Expected disabilities - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Old" is the sum of actual probabilities applied in the valuation.

Female Age-Based Disability Experience



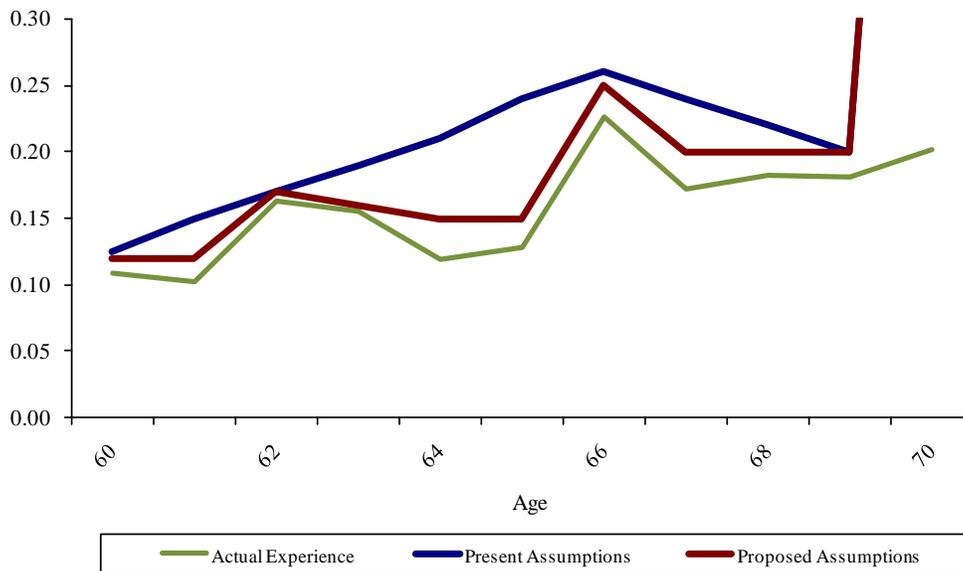
EMPLOYEES

MALE AGE-BASED RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
59 & Under	14	11	1.2727	N\A	N\A	2.7	-
60	163	1,507	0.1082	0.1250	0.1200	188.5	180.8
61	133	1,303	0.1021	0.1500	0.1200	195.8	156.4
62	180	1,105	0.1629	0.1700	0.1700	187.9	187.9
63	139	893	0.1557	0.1900	0.1600	170.2	142.9
64	83	697	0.1191	0.2100	0.1500	146.6	104.6
65	72	562	0.1281	0.2400	0.1500	134.9	84.3
66	95	420	0.2262	0.2600	0.2500	109.2	105.0
67	53	308	0.1721	0.2400	0.2000	74.0	61.6
68	38	209	0.1818	0.2200	0.2000	46.0	41.8
69	25	138	0.1812	0.2000	0.2000	27.6	27.6
70	21	104	0.2019	1.0000	1.0000	104.0	104.0
Totals	1,016	7,257	0.1400			1,387.4	1,196.9
71 & Over	52	418	0.1244			418.0	418.0
Total	1,068	7,675	0.1392			1,805.4	1,614.9

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

Male Age-Based Retirement Experience



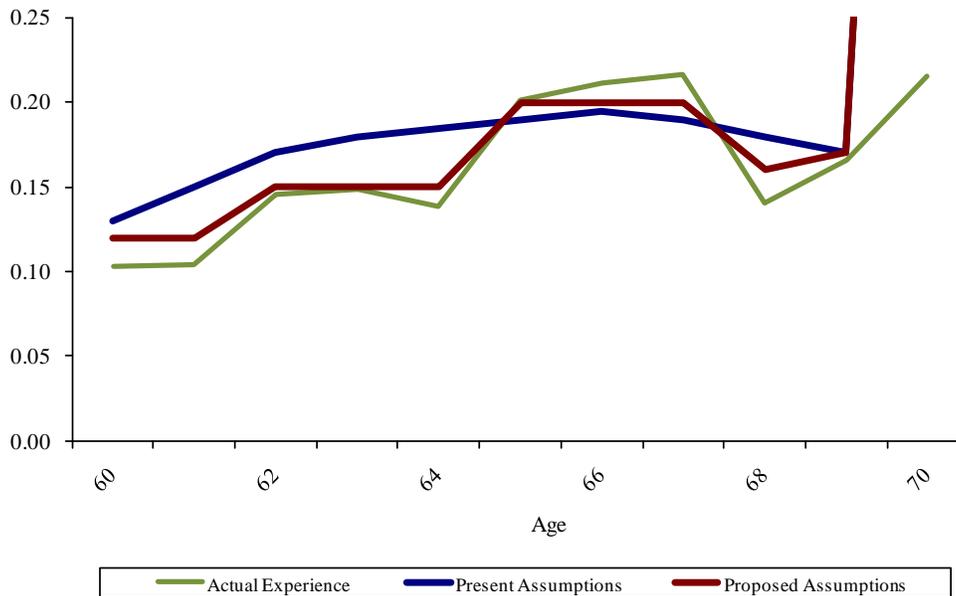
EMPLOYEES

FEMALE AGE-BASED RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
59 & Under	35	-	N\A	N\A	N\A	-	-
60	234	2,265	0.1033	0.1300	0.1200	295.1	271.8
61	193	1,862	0.1037	0.1500	0.1200	279.6	223.4
62	224	1,538	0.1456	0.1700	0.1500	261.6	230.7
63	178	1,197	0.1487	0.1800	0.1500	215.8	179.6
64	117	842	0.1390	0.1850	0.1500	155.9	126.3
65	133	661	0.2012	0.1900	0.2000	125.7	132.2
66	107	506	0.2115	0.1950	0.2000	98.8	101.2
67	76	351	0.2165	0.1900	0.2000	66.7	70.2
68	36	256	0.1406	0.1800	0.1600	46.1	41.0
69	32	193	0.1658	0.1700	0.1700	32.8	32.8
70	31	144	0.2153	1.0000	1.0000	144.0	144.0
Totals	1,396	9,815	0.1422			1,722.1	1,553.2
71 & Over	78	423	0.1844			423.0	423.0
Total	1,474	10,238	0.1440			2,145.1	1,976.2

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

Female Age-Based Retirement Experience



EMPLOYEES
MALE AGE-BASED EARLY RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
50	3	603	0.0050	0.0301	0.0100	18.2	6.0
51	2	659	0.0030	0.0311	0.0100	20.5	6.6
52	7	709	0.0099	0.0321	0.0100	22.7	7.1
53	4	718	0.0056	0.0331	0.0100	23.7	7.2
54	5	779	0.0064	0.0340	0.0100	26.5	7.8
55	12	774	0.0155	0.0350	0.0200	27.1	15.5
56	17	772	0.0220	0.0440	0.0250	34.1	19.3
57	18	770	0.0234	0.0550	0.0250	42.4	19.3
58	25	789	0.0317	0.0770	0.0350	60.8	27.6
59	32	766	0.0418	0.1000	0.0500	76.9	38.3
Totals	125	7,339	0.0170			352.9	154.7
60 & Over	8	-	N\A			-	-
Total	133	7,339	0.0181			352.9	154.7

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

EMPLOYEES
MALE RULE-X EARLY RETIREMENT EXPERIENCE

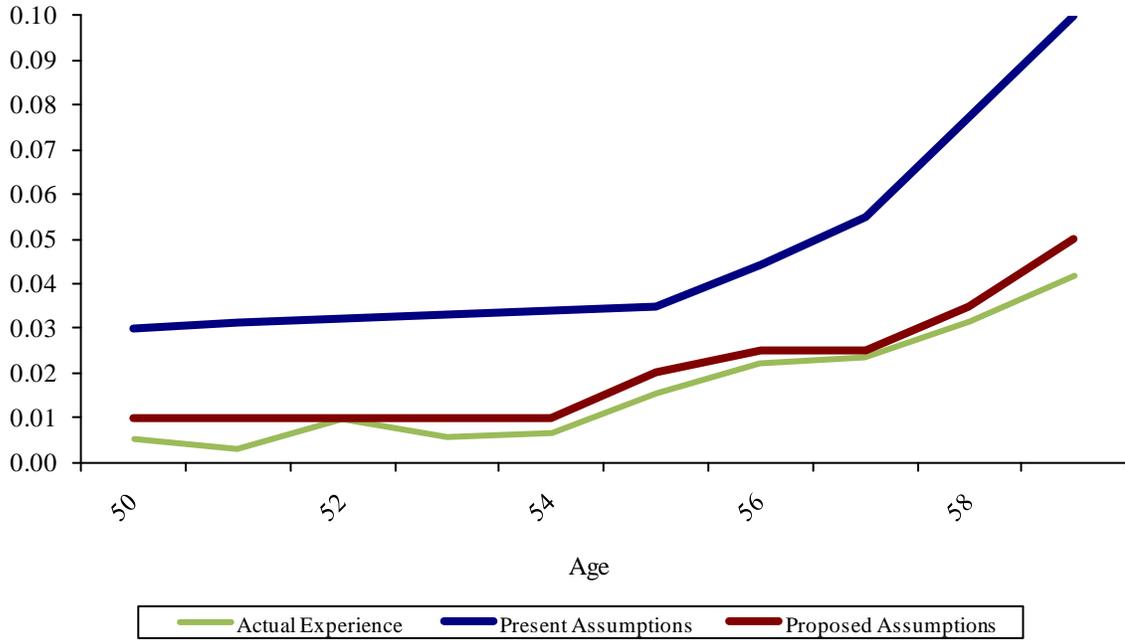
Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
45	-	56	0.0000	0.0253	0.0100	1.4	0.6
46	-	96	0.0000	0.0262	0.0100	2.5	1.0
47	-	160	0.0000	0.0272	0.0100	4.4	1.6
48	1	243	0.0041	0.0282	0.0100	6.8	2.4
49	1	316	0.0032	0.0292	0.0100	9.2	3.2
50	3	302	0.0099	0.0301	0.0150	9.1	4.5
51	9	322	0.0280	0.0311	0.0300	10.0	9.7
52	9	308	0.0292	0.0321	0.0300	9.9	9.2
53	14	318	0.0440	0.0331	0.0400	10.5	12.7
54	16	322	0.0497	0.0340	0.0450	11.0	14.5
55	36	317	0.1136	0.0350	0.0800	11.1	25.4
56	36	281	0.1281	0.0440	0.1000	12.4	28.1
57	34	251	0.1355	0.0550	0.1100	13.8	27.6
58	30	221	0.1357	0.0770	0.1100	17.0	24.3
59	46	204	0.2255	0.1000	0.1800	20.5	36.7
Totals	235	3,717	0.0632			149.6	201.5
60 & Over	5	-	N\A			-	-
Total	240	3,717	0.0646			149.6	201.5

** "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

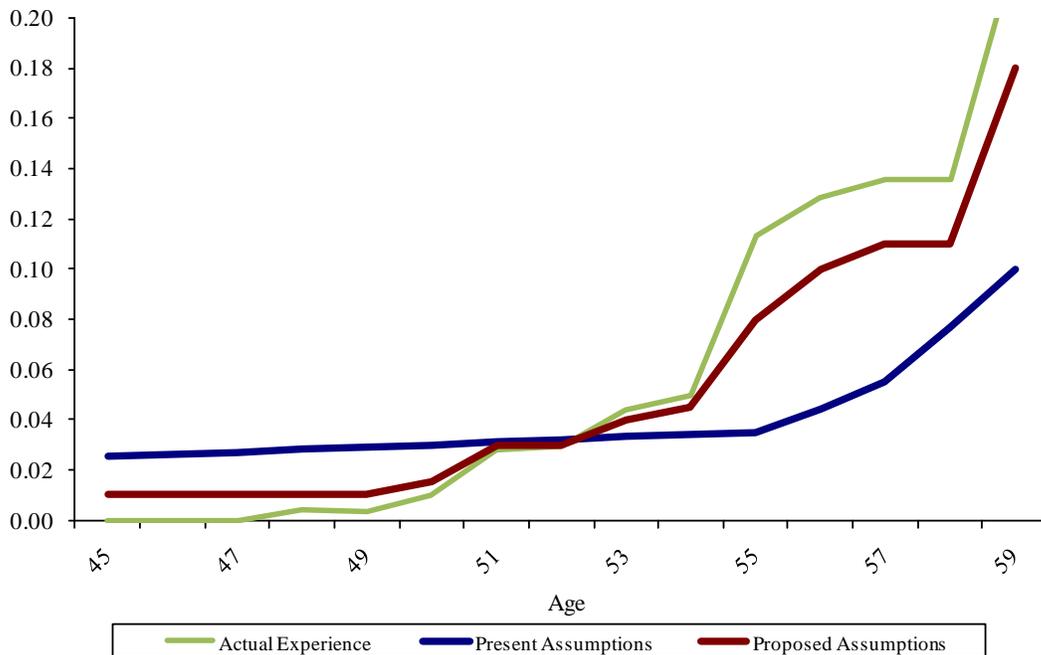
EMPLOYEES

MALE EARLY RETIREMENT GRAPHS

Male Age-Based Early Retirement Experience



Male Rule-X Early Retirement Experience



EMPLOYEES
FEMALE AGE-BASED EARLY RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
50	3	958	0.0031	0.0300	0.0100	28.7	9.6
51	7	1,059	0.0066	0.0300	0.0100	31.7	10.6
52	10	1,126	0.0089	0.0300	0.0100	33.8	11.3
53	4	1,223	0.0033	0.0300	0.0100	36.7	12.2
54	16	1,238	0.0129	0.0300	0.0150	37.2	18.6
55	28	1,236	0.0227	0.0300	0.0250	37.1	30.9
56	41	1,278	0.0321	0.0400	0.0350	51.2	44.7
57	33	1,291	0.0256	0.0500	0.0300	64.6	38.7
58	50	1,309	0.0382	0.0700	0.0400	91.7	52.4
59	68	1,316	0.0517	0.1050	0.0550	138.3	72.4
Totals	260	12,034	0.0216			551.0	301.4
60 & Over	12	-	N/A			-	-
Total	272	12,034	0.0226			551.0	301.4

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

EMPLOYEES
FEMALE RULE-X EARLY RETIREMENT EXPERIENCE

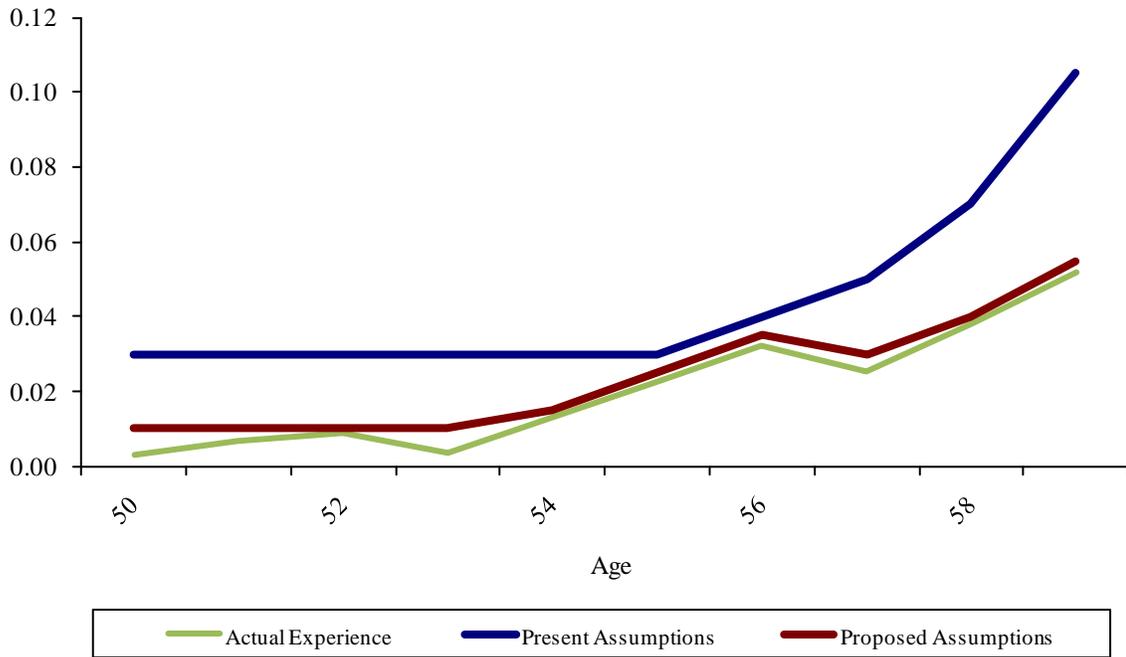
Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
45	-	63	0.0000	0.0252	0.0100	1.6	0.6
46	-	117	0.0000	0.0261	0.0100	3.1	1.2
47	2	179	0.0112	0.0271	0.0150	4.9	2.7
48	3	262	0.0115	0.0281	0.0150	7.3	3.9
49	3	340	0.0088	0.0290	0.0100	9.8	3.4
50	6	310	0.0194	0.0300	0.0200	9.3	6.2
51	7	299	0.0234	0.0300	0.0250	8.9	7.5
52	5	291	0.0172	0.0300	0.0200	8.7	5.8
53	11	290	0.0379	0.0300	0.0350	8.7	10.2
54	15	268	0.0560	0.0300	0.0550	8.0	14.7
55	26	237	0.1097	0.0300	0.1000	7.1	23.7
56	13	191	0.0681	0.0400	0.0600	7.7	11.5
57	21	155	0.1355	0.0500	0.1300	7.8	20.2
58	21	124	0.1694	0.0700	0.1500	8.7	18.6
59	12	93	0.1290	0.1050	0.1500	9.8	14.0
Totals	145	3,219	0.0450			111.5	144.2
60 & Over	4	-	N/A			-	-
Total	149	3,219	0.0463			111.5	144.2

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

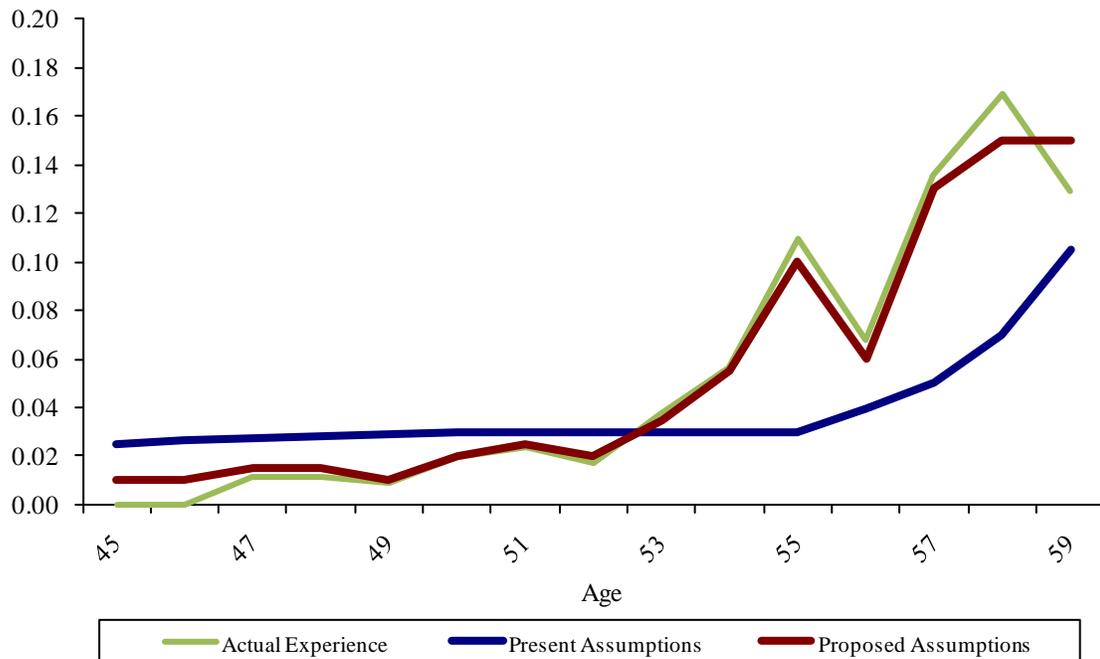
EMPLOYEES

FEMALE EARLY RETIREMENT GRAPHS

Female Age-Based Early Retirement Experience



Female Rule-X Early Retirement Experience



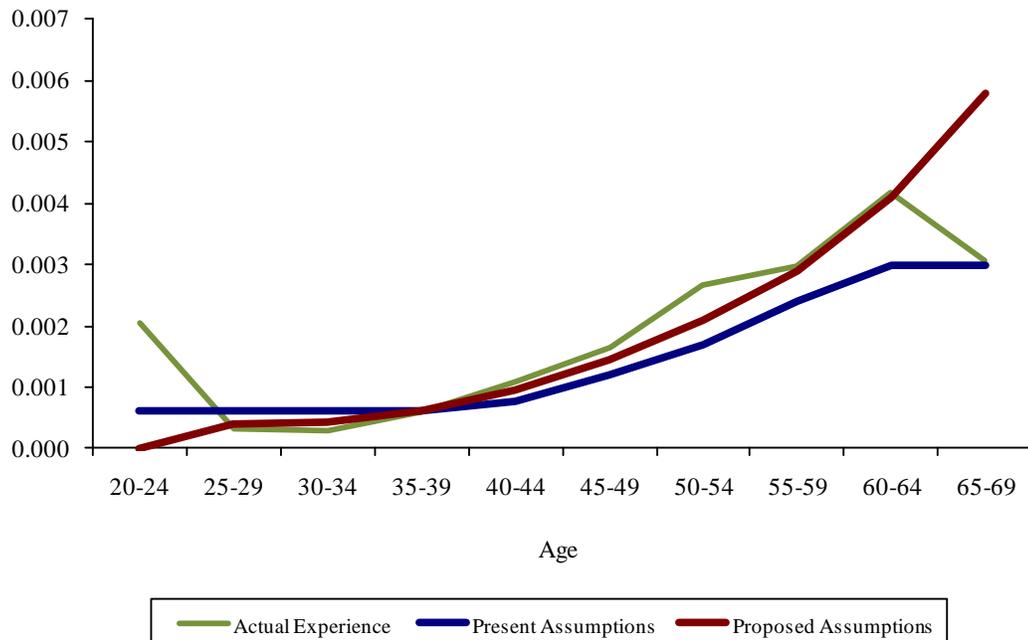
EMPLOYEES MALE PRE-RETIREMENT MORTALITY

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
Under 20	-	22	0.0000	0.0006	0.0000	-	-
20-24	3	1,472	0.0020	0.0006	0.0000	0.9	-
25-29	1	3,148	0.0003	0.0006	0.0004	1.9	1.3
30-34	1	3,347	0.0003	0.0006	0.0004	2.0	1.5
35-39	3	4,944	0.0006	0.0006	0.0006	3.0	3.1
40-44	7	6,502	0.0011	0.0008	0.0010	5.0	6.3
45-49	14	8,447	0.0017	0.0012	0.0014	10.2	12.2
50-54	25	9,420	0.0027	0.0017	0.0021	16.0	19.6
55-59	27	9,111	0.0030	0.0024	0.0029	21.7	26.3
60-64	23	5,507	0.0042	0.0030	0.0041	16.5	22.0
65-69	5	1,637	0.0031	0.0030	0.0058	4.9	9.1
70-74	4	-	N\A	0.0030	0.0081	-	-
75 and over	-	-	N\A	0.0030	0.0109	-	-
Totals	113	53,557	0.0021	0.0015	0.0019	82.1	101.4
Ref				490	124		

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Male Pre-Retirement Mortality Experience



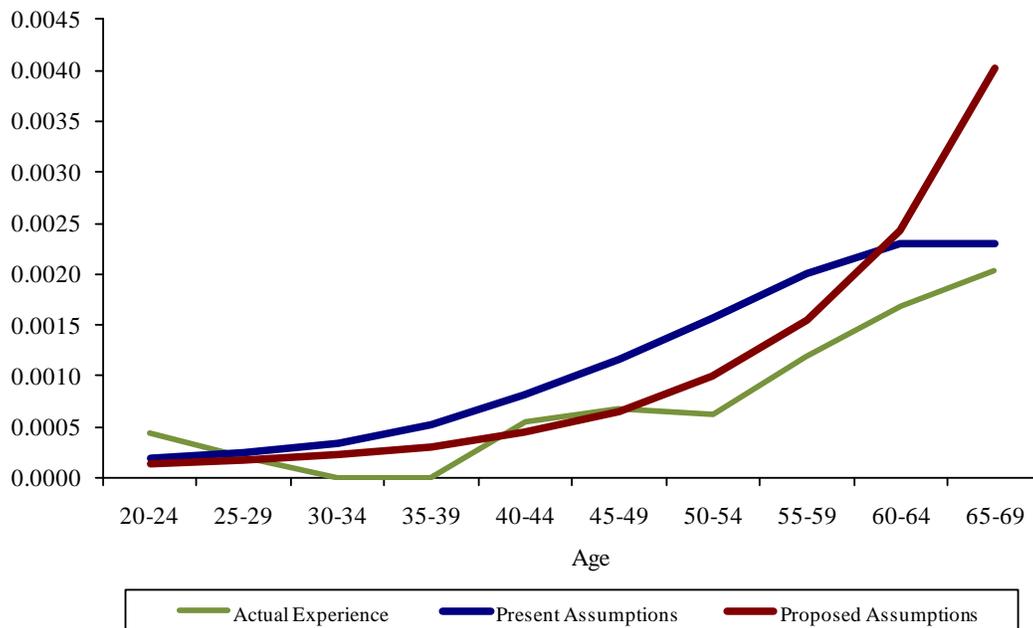
EMPLOYEES FEMALE PRE-RETIREMENT MORTALITY

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
Under 20	-	62	0.0000	0.0002	0.0000	-	-
20-24	1	2,312	0.0004	0.0002	0.0001	0.5	0.3
25-29	1	5,156	0.0002	0.0002	0.0002	1.2	0.9
30-34	-	5,214	0.0000	0.0003	0.0002	1.8	1.2
35-39	-	7,485	0.0000	0.0005	0.0003	3.9	2.4
40-44	6	11,039	0.0005	0.0008	0.0005	9.2	5.0
45-49	10	14,677	0.0007	0.0012	0.0006	17.1	9.8
50-54	10	15,937	0.0006	0.0016	0.0010	24.8	15.9
55-59	16	13,542	0.0012	0.0020	0.0015	26.9	20.9
60-64	13	7,706	0.0017	0.0023	0.0024	17.7	18.3
65-69	4	1,970	0.0020	0.0023	0.0040	4.5	7.5
70-74	2	-	N/A	0.0023	0.0000	-	-
75 and over	-	-	N/A	0.0023	0.0000	-	-
Totals	63	85,100	0.0007	0.0013	0.0010	107.6	82.2
Ref				491	92		

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Female Pre-Retirement Mortality Experience



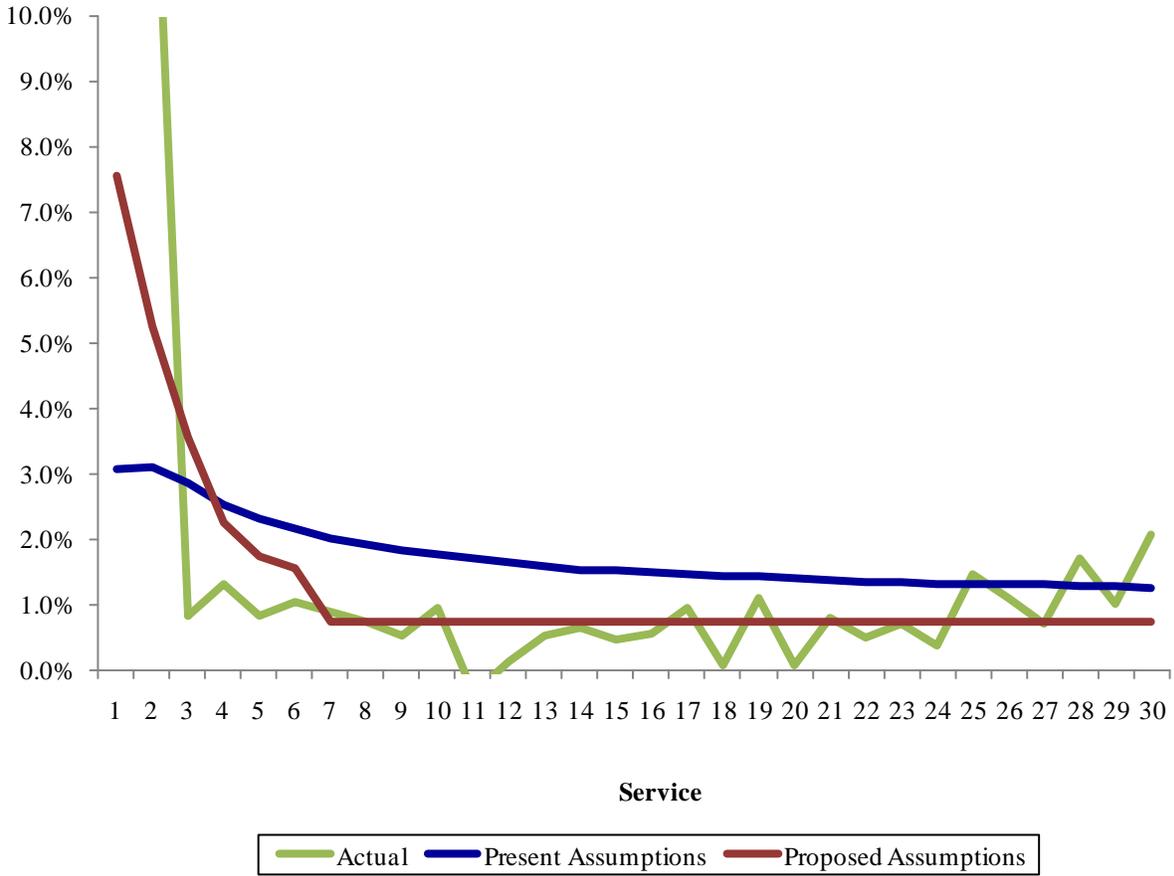
EMPLOYEES
MERIT AND LONGEVITY PAY INCREASES

Service		Merit/Seniority % Increase		
		Actual*	Expected	
			Old	New
Index	Number			
1	4,459	93.75 %	3.06 %	7.55 %
2	11,361	13.83 %	3.10 %	5.25 %
3	9,679	0.83 %	2.85 %	3.55 %
4	8,436	1.31 %	2.53 %	2.25 %
5	7,729	0.83 %	2.31 %	1.75 %
6	7,081	1.05 %	2.16 %	1.55 %
7	6,511	0.88 %	2.02 %	0.75 %
8	6,071	0.74 %	1.91 %	0.75 %
9	5,395	0.54 %	1.84 %	0.75 %
10	4,648	0.95 %	1.77 %	0.75 %
11	4,008	(0.36)%	1.71 %	0.75 %
12	3,538	0.13 %	1.64 %	0.75 %
13	3,221	0.54 %	1.58 %	0.75 %
14	2,987	0.66 %	1.54 %	0.75 %
15	2,648	0.46 %	1.53 %	0.75 %
16	2,531	0.57 %	1.49 %	0.75 %
17	2,590	0.95 %	1.47 %	0.75 %
18	2,668	0.06 %	1.45 %	0.75 %
19	2,601	1.10 %	1.43 %	0.75 %
20	2,532	0.08 %	1.40 %	0.75 %
21	2,386	0.80 %	1.38 %	0.75 %
22	1,995	0.48 %	1.36 %	0.75 %
23	1,544	0.71 %	1.35 %	0.75 %
24	1,300	0.38 %	1.33 %	0.75 %
25	1,148	1.46 %	1.32 %	0.75 %
26	1,028	1.09 %	1.32 %	0.75 %
27	940	0.71 %	1.31 %	0.75 %
28	898	1.70 %	1.29 %	0.75 %
29	832	1.02 %	1.28 %	0.75 %
30	744	2.07 %	1.26 %	0.75 %
Total	113,509			

* Actual merit is actual total reduced by the estimated across-the-board increase of 4%.

EMPLOYEES

MERIT AND LONGEVITY PAY INCREASES GRAPH



SECTION E
TEACHERS

TEACHERS

MALE WITHDRAWAL EXPERIENCE

Summary of Age-Based Withdrawal Experience With 5 or More Years of Service

Age	Withdrawals	Exposure	Crude Rates	Sample Rates*		Expected Withdrawals**	
				Old	New	Old	New
Under 20	-	-	N\A	0.0480	0.0350	-	-
20-24	-	-	N\A	0.0465	0.0350	-	-
25-29	9	243	0.0370	0.0430	0.0350	10.1	8.5
30-34	46	1,399	0.0329	0.0380	0.0350	53.1	49.0
35-39	78	2,036	0.0383	0.0320	0.0350	65.1	71.3
40-44	64	2,130	0.0300	0.0275	0.0350	58.9	74.6
45-49	62	1,945	0.0319	0.0305	0.0350	59.0	68.1
50-54	75	637	0.1177	0.0370	0.0350	23.7	22.3
55-59	70	430	0.1628	0.0420	0.0350	18.6	15.1
Totals	404	8,820	0.0458	0.0327	0.0350	288.5	308.9
Ref				951	61		

Summary of Service-Based Withdrawal Experience With Less Than 5 Years of Service

Service Index	Withdrawals	Exposure	Crude Rates	Sample Rates		Expected Withdrawals**	
				Old#	New	Old	New
1	80	201	0.3980	0.1035	0.3500	20.8	70.4
2	303	1,674	0.1810	0.0771	0.1700	129.0	284.6
3	222	1,466	0.1514	0.0379	0.1400	55.6	205.2
4	151	1,300	0.1162	0.0371	0.1000	48.2	130.0
5	100	1,188	0.0842	0.0364	0.0800	43.3	95.0
Totals	856	5,829	0.1469	0.0509	0.1347	296.9	785.2
Ref				1	184		

* Sample rates are taken from midpoint of age group.

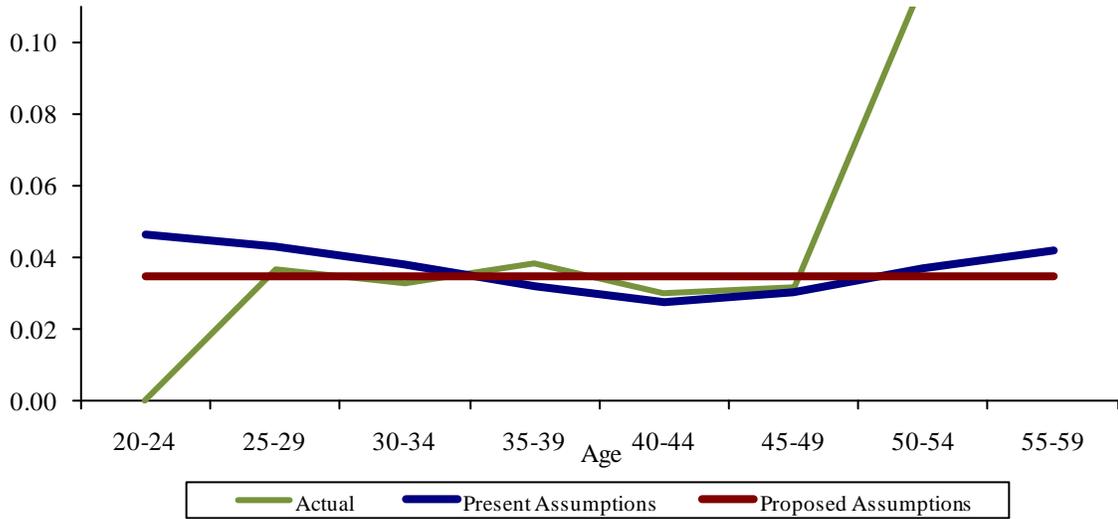
** "Expected withdrawals - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected withdrawals - Old" is the sum of actual probabilities applied in the valuation.

Based on expected withdrawals developed from valuation divided by exposure.

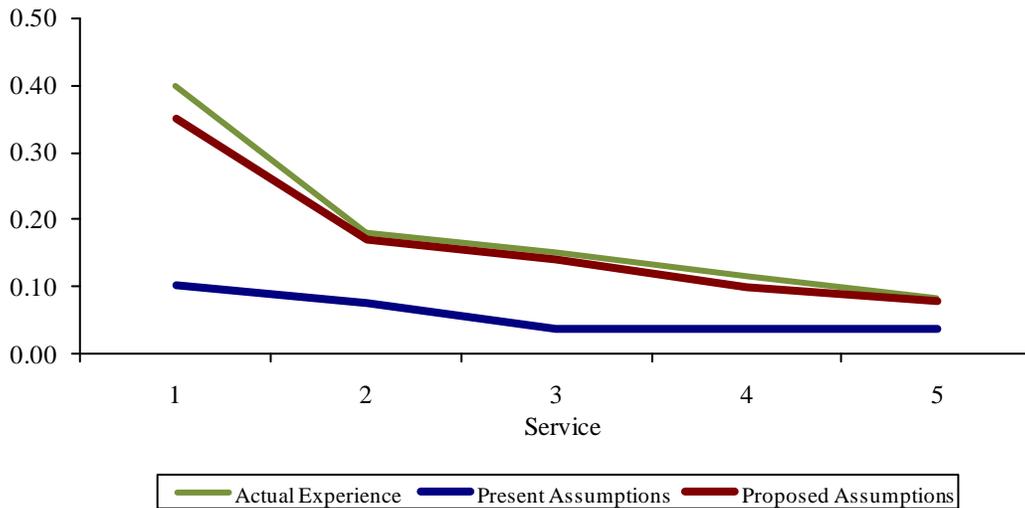
TEACHERS

MALE WITHDRAWAL GRAPHS

*Age-Based Withdrawal Experience
With 5 or More Years of Service*



*Service-Based Withdrawal Experience
With Less Than 5 Years of Service*



TEACHERS

FEMALE WITHDRAWAL EXPERIENCE

Summary of Age-Based Withdrawal Experience With 5 or More Years of Service

Age	Withdrawals	Exposure	Crude Rates	Sample Rates*		Expected Withdrawals**	
				Old	New	Old	New
Under 20	-	-	N\A	0.0510	0.0450	-	-
20-24	-	-	N\A	0.0480	0.0450	-	-
25-29	56	958	0.0585	0.0430	0.0450	40.0	43.1
30-34	315	4,652	0.0677	0.0380	0.0450	176.6	209.3
35-39	306	5,328	0.0574	0.0330	0.0450	176.4	239.8
40-44	160	5,216	0.0307	0.0260	0.0450	135.2	234.7
45-49	222	6,741	0.0329	0.0220	0.0450	149.7	303.3
50-54	216	3,084	0.0700	0.0290	0.0450	88.9	138.8
55-59	207	1,685	0.1228	0.0370	0.0450	63.2	75.8
Totals	1,482	27,664	0.0536	0.0300	0.0450	830.0	1,244.8
Ref				952	48		

Summary of Service-Based Withdrawal Experience With Less Than 5 Years of Service

Service Index	Withdrawals	Exposure	Crude Rates	Sample Rates		Expected Withdrawals**	
				Old#	New	Old	New
1	229	698	0.3281	0.1046	0.3300	73.0	230.3
2	817	5,931	0.1378	0.0735	0.1800	435.9	1,067.6
3	661	5,234	0.1263	0.0357	0.1300	186.7	680.4
4	546	4,712	0.1159	0.0350	0.1100	165.1	518.3
5	422	4,380	0.0963	0.0343	0.0900	150.2	394.2
Totals	2,675	20,955	0.1277	0.0482	0.1380	1,010.9	2,890.8
Ref				1	676		

* Sample rates are taken from midpoint of age group.

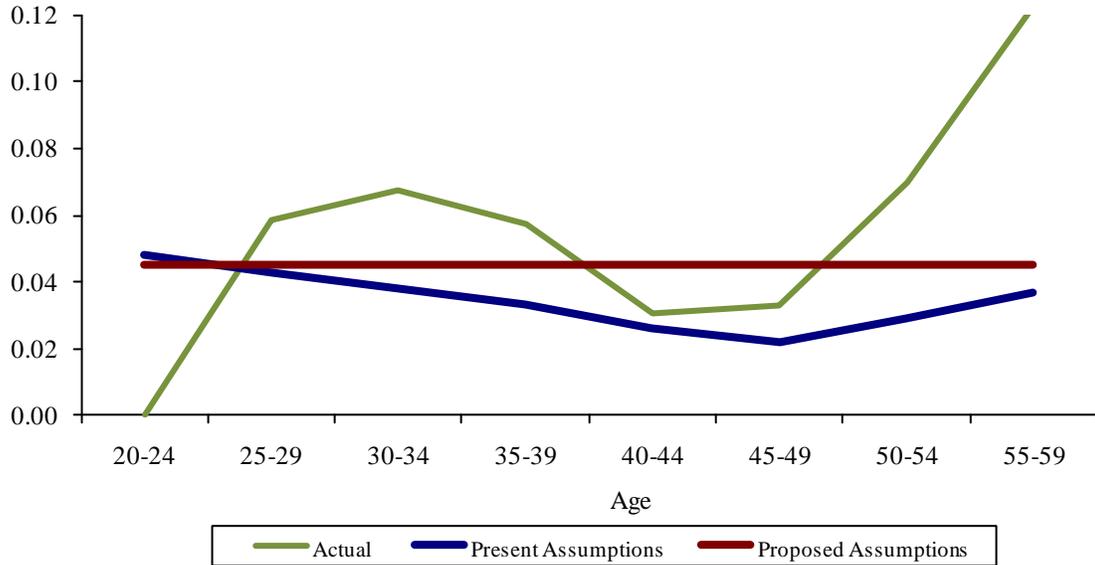
** "Expected withdrawals - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected withdrawals - Old" is the sum of actual probabilities applied in the valuation.

Based on expected withdrawals developed from valuation divided by exposure.

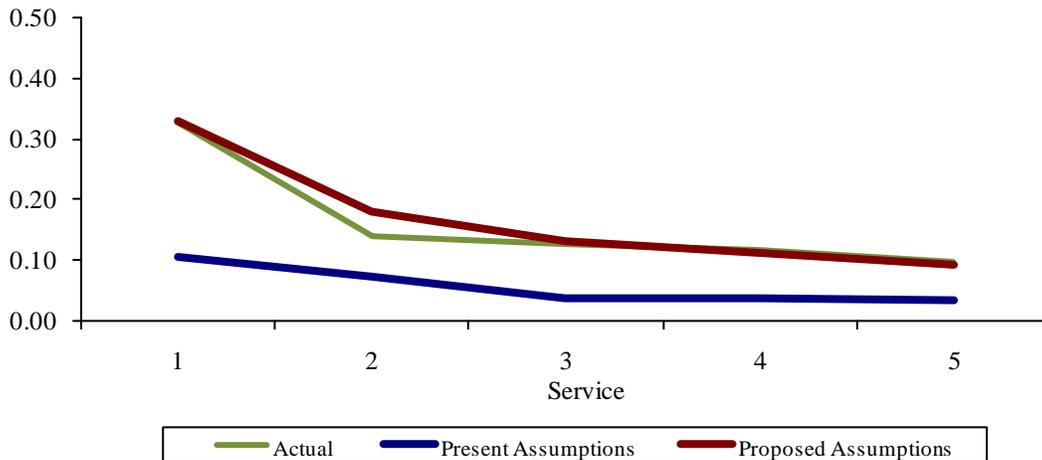
TEACHERS

FEMALE WITHDRAWAL GRAPHS

*Age-Based Withdrawal Experience
With 5 or More Years of Service*



*Service-Based Withdrawal Experience
With Less Than 5 Years of Service*



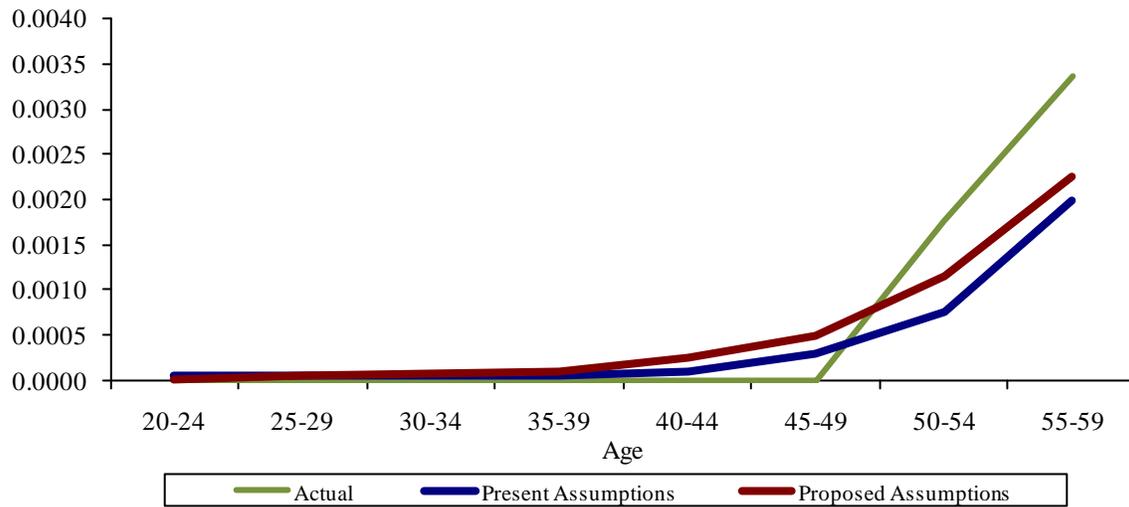
TEACHERS MALE DISABILITY EXPERIENCE

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 20	-	-	N\A	0.00005	0.00006	-	-
20-24	-	107	0.0000	0.00005	0.00000	0.0	-
25-29	-	1,814	0.0000	0.00005	0.00006	0.1	0.1
30-34	-	2,641	0.0000	0.00005	0.00008	0.1	0.2
35-39	-	2,885	0.0000	0.00005	0.00010	0.1	0.3
40-44	-	2,718	0.0000	0.00009	0.00026	0.2	0.7
45-49	-	2,462	0.0000	0.00029	0.00049	0.7	1.2
50-54	2	1,133	0.0018	0.00075	0.00115	0.8	1.3
55-59	3	889	0.0034	0.00200	0.00225	1.8	2.0
Totals	5	14,649	0.0003	0.0003	0.0004	4.0	5.8
Ref				491	2		

* Sample rates are taken from midpoint of age group.

** "Expected disabilities - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Old" is the sum of actual probabilities applied in the valuation.

Male Age-Based Disability Experience



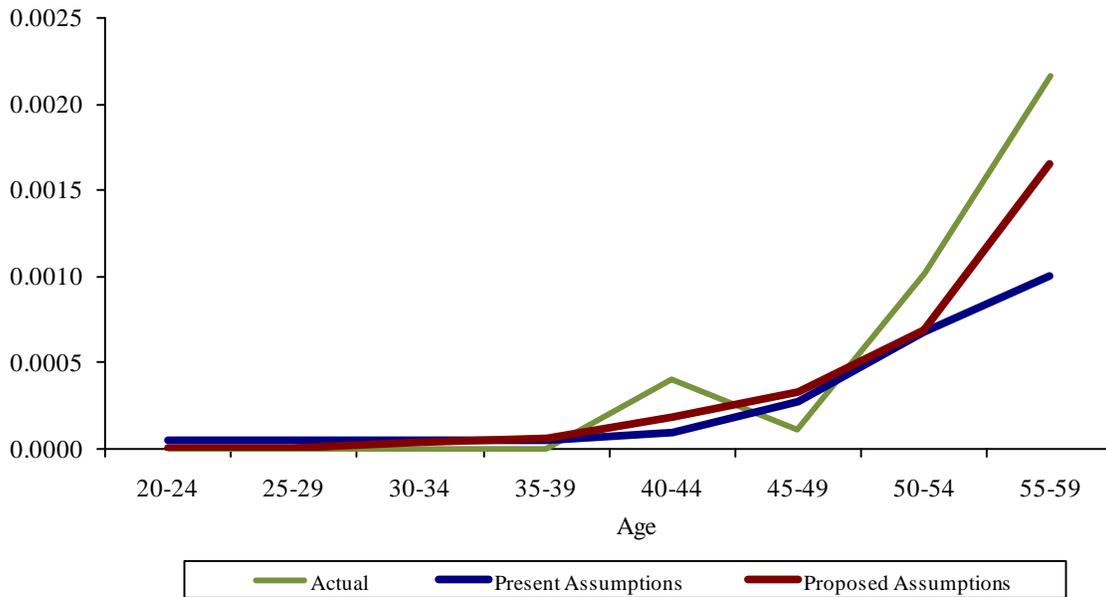
TEACHERS FEMALE DISABILITY EXPERIENCE

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 20	-	1	0.0000	0.00005	0.00000	0.0	-
20-24	-	575	0.0000	0.00005	0.00000	0.0	-
25-29	-	7,306	0.0000	0.00005	0.00000	0.4	-
30-34	-	8,462	0.0000	0.00005	0.00003	0.4	0.1
35-39	-	7,755	0.0000	0.00005	0.00006	0.4	0.5
40-44	3	7,515	0.0004	0.00009	0.00018	0.7	1.5
45-49	1	9,306	0.0001	0.00027	0.00033	2.5	3.0
50-54	5	4,921	0.0010	0.00067	0.00069	3.3	3.5
55-59	6	2,778	0.0022	0.00100	0.00165	2.8	4.5
Totals	15	48,619	0.0003	0.00022	0.00027	10.5	13.1
Ref				492	66		

* Sample rates are taken from midpoint of age group.

** "Expected disabilities - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Old" is the sum of actual probabilities applied in the valuation.

Female Age-Based Disability Experience



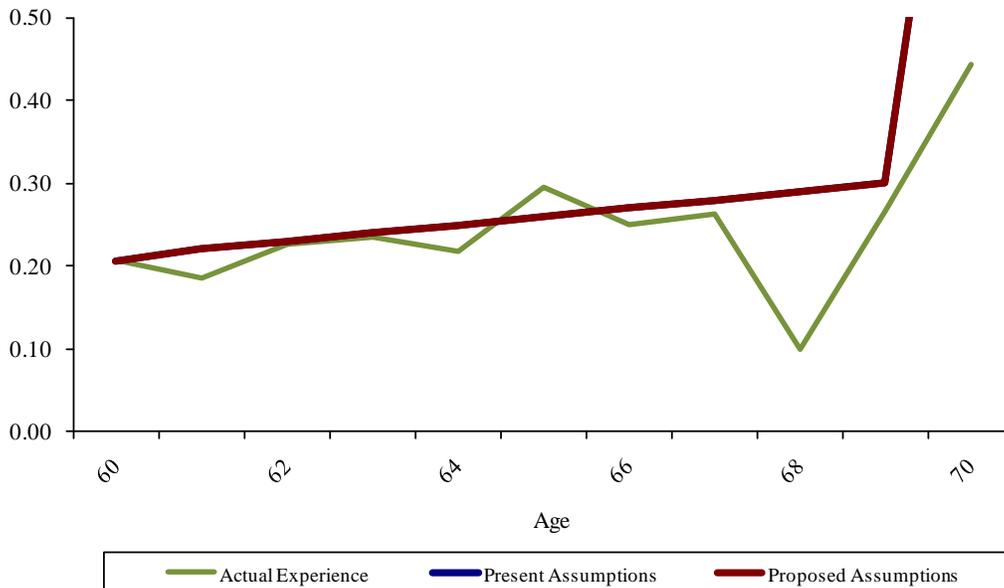
TEACHERS

MALE AGE-BASED RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
59 & Under	2	1	2.0000	N\A	N\A	-	-
60	132	641	0.2059	0.2050	0.2050	131.4	131.4
61	90	483	0.1863	0.2200	0.2200	106.3	106.3
62	82	364	0.2253	0.2300	0.2300	83.7	83.7
63	58	248	0.2339	0.2400	0.2400	59.5	59.5
64	32	147	0.2177	0.2500	0.2500	36.8	36.8
65	34	115	0.2957	0.2600	0.2600	29.9	29.9
66	16	64	0.2500	0.2700	0.2700	17.3	17.3
67	11	42	0.2619	0.2800	0.2800	11.8	11.8
68	2	20	0.1000	0.2900	0.2900	5.8	5.8
69	4	15	0.2667	0.3000	0.3000	4.5	4.5
70	4	9	0.4444	1.0000	1.0000	9.0	9.0
Totals	467	2,149	0.2173			496.0	496.0
71 & Over	3	22	0.1364			22.0	22.0
Total	470	2,171	0.2165			518.0	518.0

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

Age-Based Retirement Experience



No change recommended, therefore "Present" and "Proposed" are the same.

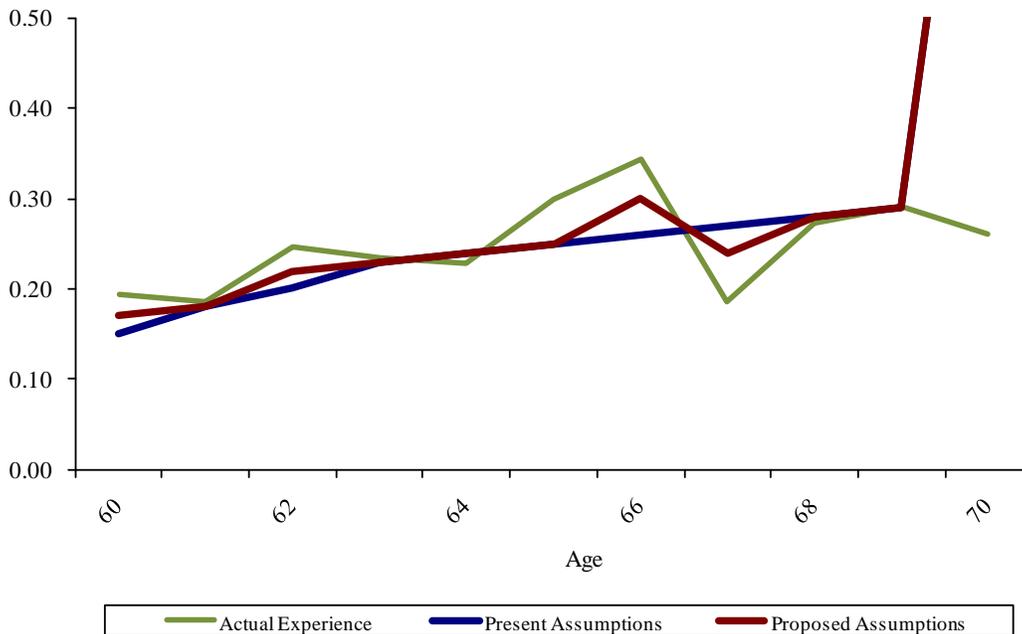
TEACHERS

FEMALE AGE-BASED RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
59 & Under	5	-	N\A	N\A	N\A	-	-
60	348	1,795	0.1939	0.1500	0.1700	269.1	305.2
61	244	1,319	0.1850	0.1800	0.1800	237.2	237.4
62	238	964	0.2469	0.2000	0.2200	192.7	212.1
63	142	606	0.2343	0.2300	0.2300	139.3	139.4
64	91	397	0.2292	0.2400	0.2400	95.2	95.3
65	74	247	0.2996	0.2500	0.2500	61.7	61.8
66	48	140	0.3429	0.2600	0.3000	36.4	42.0
67	13	70	0.1857	0.2700	0.2400	18.9	16.8
68	15	55	0.2727	0.2800	0.2800	15.4	15.4
69	9	31	0.2903	0.2900	0.2900	9.0	9.0
70	6	23	0.2609	1.0000	1.0000	23.0	23.0
Totals	1,233	5,647	0.2183			1,097.9	1,157.4
71 & Over	15	48	0.3125			48.0	48.0
Total	1,248	5,695	0.2191			1,145.9	1,205.4

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

Age-Based Retirement Experience



TEACHERS

MALE AGE-BASED EARLY RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
50	-	194	0.0000	0.0200	0.0100	3.9	1.9
51	-	217	0.0000	0.0200	0.0100	4.4	2.2
52	2	235	0.0085	0.0275	0.0100	6.5	2.4
53	-	275	0.0000	0.0350	0.0100	9.6	2.8
54	3	317	0.0095	0.0425	0.0100	13.5	3.2
55	2	329	0.0061	0.0500	0.0100	16.4	3.3
56	12	352	0.0341	0.0800	0.0350	28.1	12.3
57	6	351	0.0171	0.1000	0.0200	34.9	7.0
58	24	340	0.0706	0.1300	0.0850	44.2	28.9
59	14	338	0.0414	0.1800	0.0600	60.6	20.3
Totals	63	2,948	0.0214			222.0	84.3

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

TEACHERS
MALE RULE OF X EARLY RETIREMENT EXPERIENCE

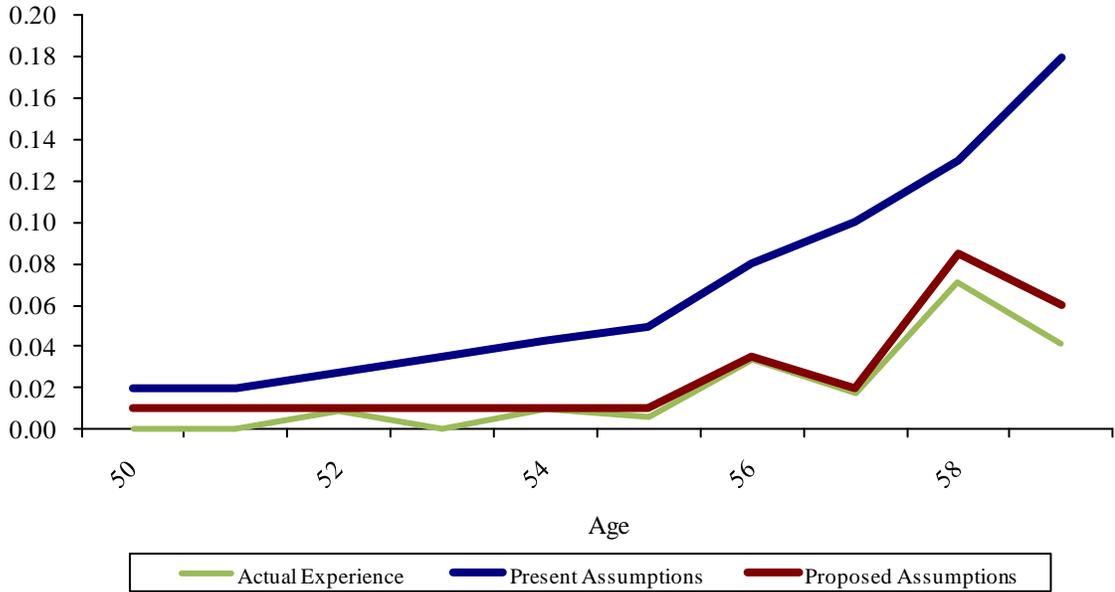
Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
45	-	2	0.0000	0.0183	0.0150	-	-
46	-	20	0.0000	0.0187	0.0150	0.4	0.3
47	1	79	0.0127	0.0190	0.0150	1.5	1.2
48	-	138	0.0000	0.0193	0.0150	2.7	2.1
49	1	192	0.0052	0.0197	0.0150	3.8	2.9
50	1	191	0.0052	0.0200	0.0150	3.8	2.9
51	1	191	0.0052	0.0200	0.0150	3.8	2.9
52	3	210	0.0143	0.0275	0.0150	5.8	3.2
53	3	239	0.0126	0.0350	0.0150	8.4	3.6
54	6	280	0.0214	0.0425	0.0300	11.9	8.4
55	34	311	0.1093	0.0500	0.0900	15.6	28.0
56	50	311	0.1608	0.0800	0.1500	24.8	46.7
57	53	297	0.1785	0.1000	0.1600	29.7	47.5
58	69	298	0.2315	0.1300	0.2000	38.7	59.6
59	64	253	0.2530	0.1800	0.2000	45.5	50.6
Totals	286	3,012	0.0950			196.4	259.9

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

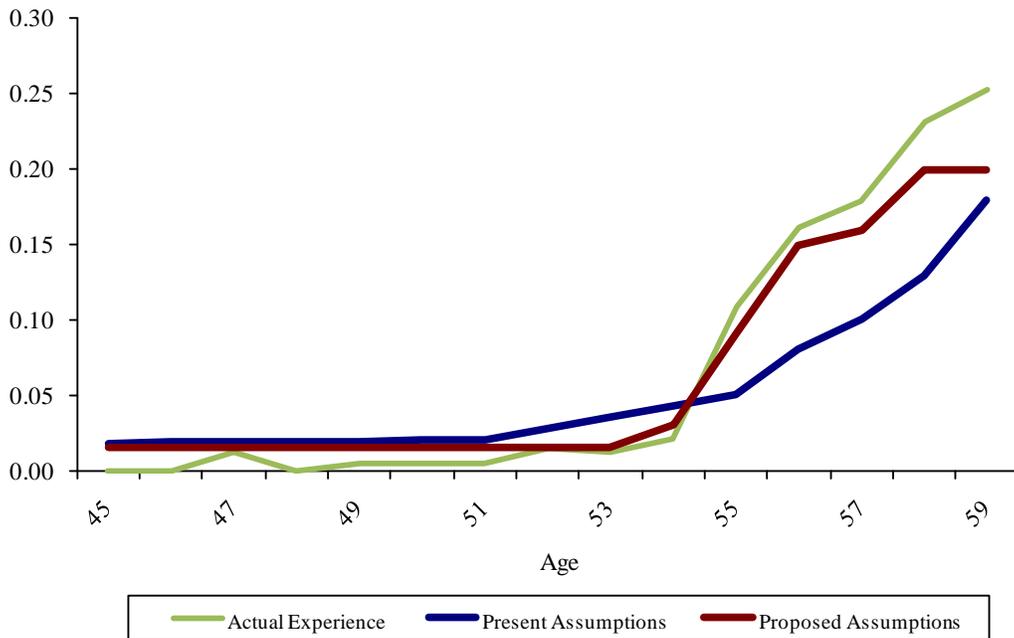
TEACHERS

MALE EARLY RETIREMENT GRAPHS

Age-Based Early Retirement Experience



Rule of X Early Retirement Experience



TEACHERS
FEMALE AGE-BASED EARLY RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
50	1	877	0.0011	0.0100	0.0050	8.8	4.4
51	2	1,019	0.0020	0.0160	0.0050	16.4	5.1
52	3	1,130	0.0027	0.0220	0.0050	24.9	5.7
53	5	1,293	0.0039	0.0280	0.0050	36.2	6.5
54	16	1,467	0.0109	0.0340	0.0150	49.9	22.0
55	34	1,494	0.0228	0.0400	0.0250	59.7	37.4
56	35	1,544	0.0227	0.0500	0.0250	77.2	38.6
57	73	1,529	0.0477	0.0700	0.0500	107.0	76.5
58	83	1,464	0.0567	0.0900	0.0600	131.6	87.8
59	129	1,345	0.0959	0.1300	0.1000	174.9	134.5
Totals	381	13,162	0.0289			686.6	418.5

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

TEACHERS
FEMALE RULE OF X EARLY RETIREMENT EXPERIENCE

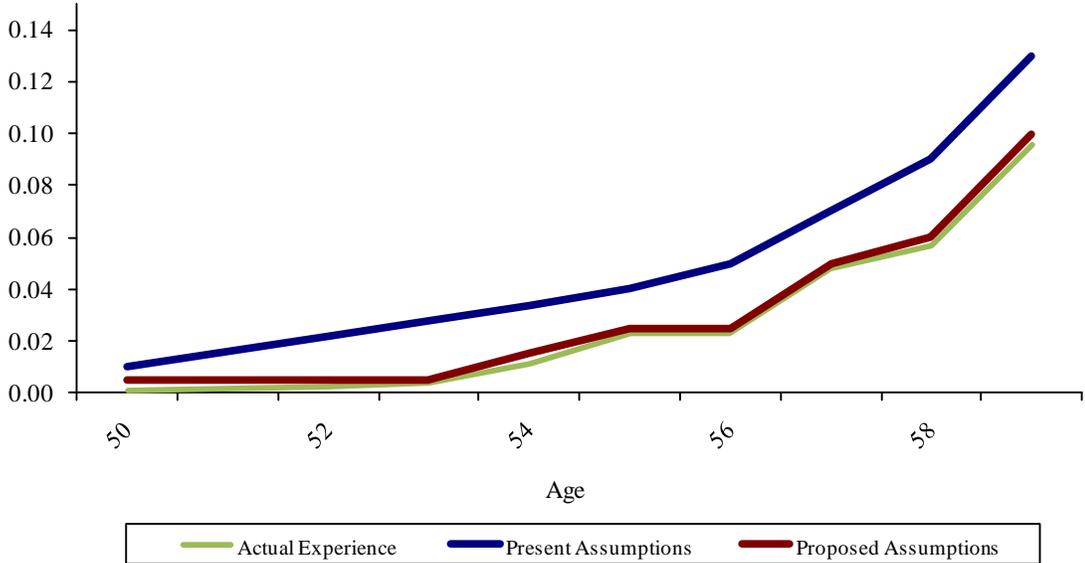
Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
45	-	13	0.0000	0.0100	0.0100	0.1	0.1
46	1	75	0.0133	0.0100	0.0100	0.8	0.8
47	-	231	0.0000	0.0100	0.0100	2.3	2.3
48	-	381	0.0000	0.0100	0.0100	3.8	3.8
49	2	516	0.0039	0.0100	0.0100	5.2	5.2
50	2	527	0.0038	0.0100	0.0100	5.3	5.3
51	2	549	0.0036	0.0160	0.0100	8.8	5.5
52	5	593	0.0084	0.0220	0.0100	13.1	5.9
53	6	646	0.0093	0.0280	0.0100	18.1	6.5
54	20	686	0.0292	0.0340	0.0300	23.3	20.6
55	79	739	0.1069	0.0400	0.0800	29.6	59.1
56	105	682	0.1540	0.0500	0.1300	34.1	88.7
57	93	620	0.1500	0.0700	0.1300	43.3	80.6
58	138	554	0.2491	0.0900	0.2000	49.9	110.8
59	107	420	0.2548	0.1300	0.2000	54.6	84.0
Totals	560	7,232	0.0774			292.2	479.2

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

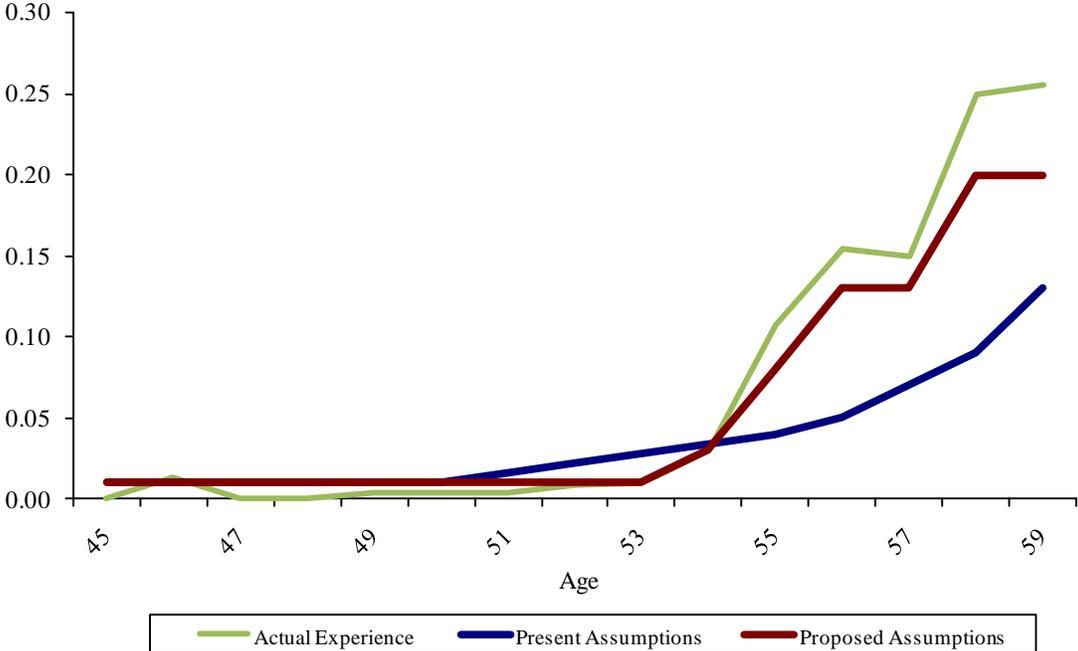
TEACHERS

FEMALE EARLY RETIREMENT GRAPHS

Age-Based Early Retirement Experience



Rule of X Early Retirement Experience



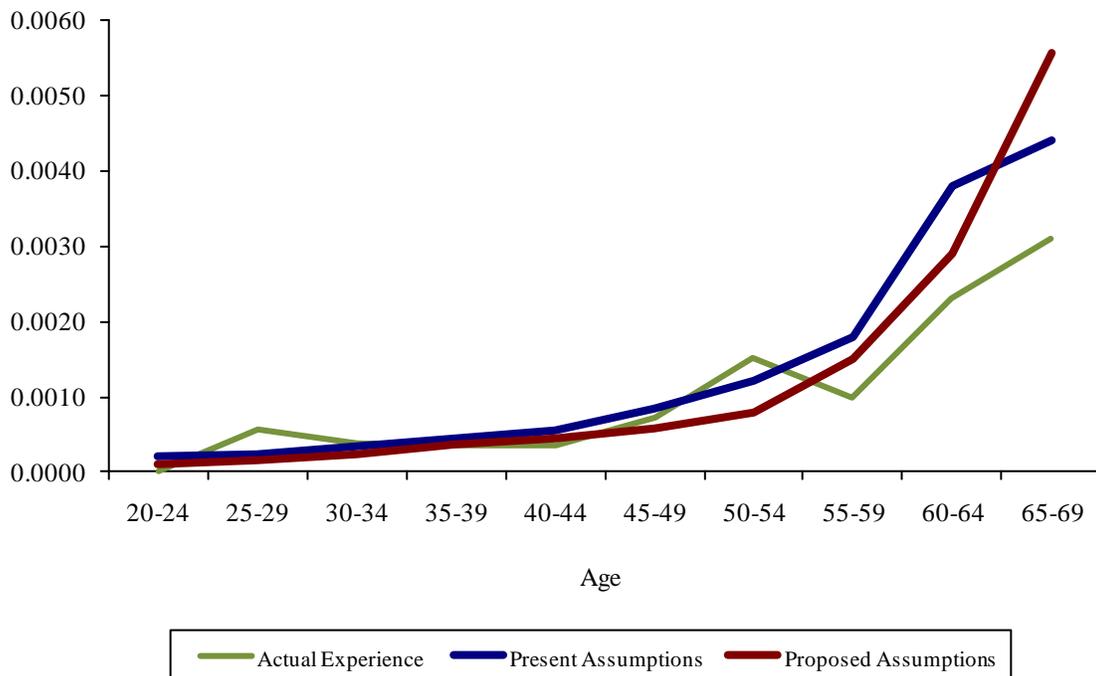
TEACHERS MALE PRE-RETIREMENT MORTALITY

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
Under 20	-	-	N/A	0.0006	0.0001	-	-
20-24	-	107	0.0000	0.0002	0.0001	-	-
25-29	1	1,788	0.0006	0.0002	0.0002	0.5	0.3
30-34	1	2,615	0.0004	0.0003	0.0002	0.9	0.6
35-39	1	2,885	0.0003	0.0004	0.0004	1.3	1.0
40-44	1	2,718	0.0004	0.0005	0.0004	1.5	1.2
45-49	2	2,788	0.0007	0.0008	0.0006	2.4	1.6
50-54	5	3,275	0.0015	0.0012	0.0008	3.9	2.7
55-59	4	4,096	0.0010	0.0018	0.0015	7.4	6.2
60-64	5	2,172	0.0023	0.0038	0.0029	7.2	6.0
65-69	1	322	0.0031	0.0044	0.0056	1.4	1.6
70-74	-	5	0.0000	0.0044	0.0091	-	-
75 and over	-	-	N/A	0.0044	0.0162	-	-
Totals	21	22,771	0.0009	0.0012	0.0009	26.5	21.2
Ref				492	454		

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Male Age-Based Pre-Retirement Mortality Experience



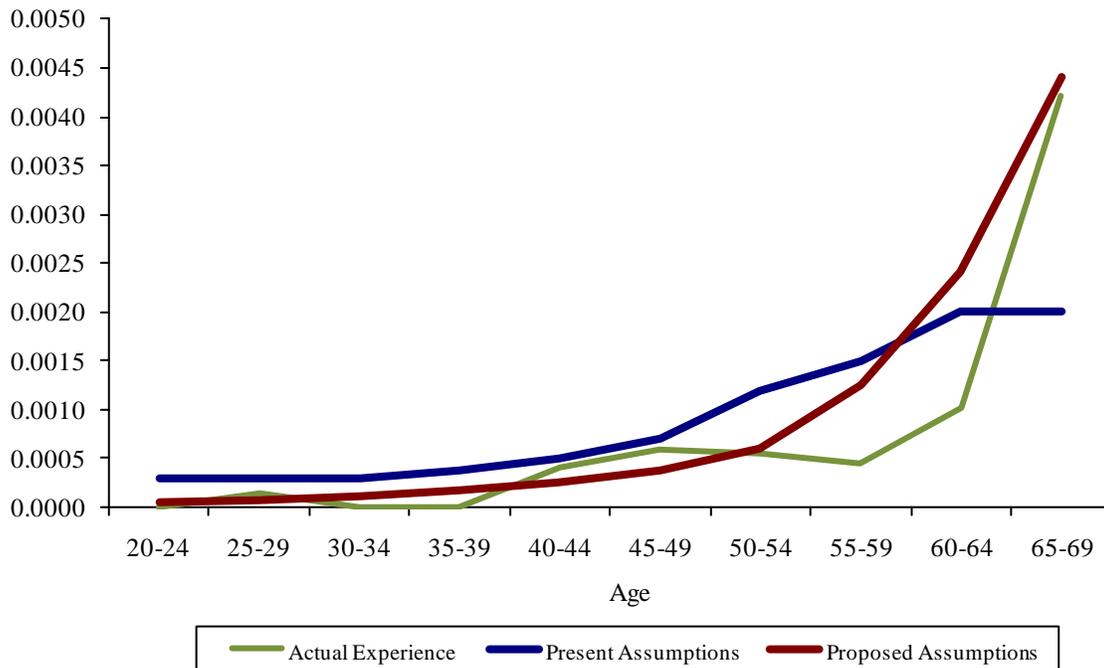
TEACHERS FEMALE PRE-RETIREMENT MORTALITY

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
Under 20	-	1	0.0000	0.0005	0.0001	-	-
20-24	-	575	0.0000	0.0003	0.0001	0.2	-
25-29	1	7,277	0.0001	0.0003	0.0001	2.2	0.5
30-34	-	8,433	0.0000	0.0003	0.0001	2.5	1.0
35-39	-	7,755	0.0000	0.0004	0.0002	2.9	1.3
40-44	3	7,515	0.0004	0.0005	0.0003	3.8	1.9
45-49	6	10,255	0.0006	0.0007	0.0004	7.3	3.9
50-54	7	12,898	0.0005	0.0012	0.0006	15.6	8.1
55-59	6	13,382	0.0004	0.0015	0.0013	20.1	16.6
60-64	6	5,931	0.0010	0.0020	0.0024	11.9	13.3
65-69	3	710	0.0042	0.0020	0.0044	1.4	2.8
70-74	-	13	0.0000	0.0020	0.0073	-	0.1
75 and over	-	-	N/A	0.0020	0.0119	-	-
Totals	32	74,745	0.0004	0.0009	0.0007	67.9	49.5
Ref				493	455		

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Female Age Based Pre-Retirement Mortality Experience



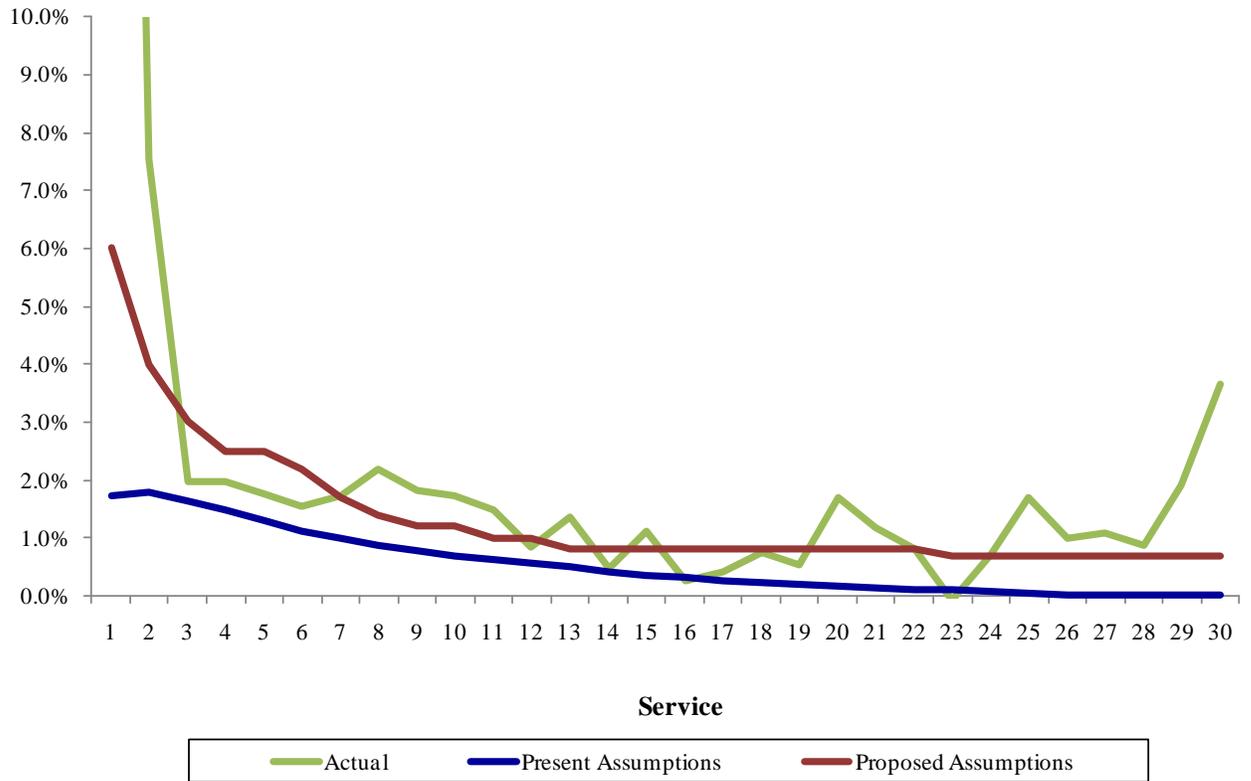
TEACHERS
MERIT AND LONGEVITY PAY INCREASE

Service		Merit/Seniority % Increase			
		Index	Number	Expected	
				Actual*	Old
1	454	38.76 %	1.72 %	6.00 %	
2	6,022	7.54 %	1.78 %	4.00 %	
3	5,430	1.98 %	1.63 %	3.00 %	
4	5,048	1.96 %	1.47 %	2.50 %	
5	4,879	1.77 %	1.30 %	2.50 %	
6	4,726	1.54 %	1.12 %	2.20 %	
7	4,461	1.72 %	0.99 %	1.70 %	
8	4,231	2.19 %	0.87 %	1.40 %	
9	3,946	1.81 %	0.79 %	1.20 %	
10	3,656	1.74 %	0.69 %	1.20 %	
11	3,332	1.48 %	0.62 %	1.00 %	
12	2,959	0.84 %	0.55 %	1.00 %	
13	2,671	1.35 %	0.49 %	0.80 %	
14	2,411	0.48 %	0.42 %	0.80 %	
15	2,091	1.12 %	0.36 %	0.80 %	
16	1,875	0.24 %	0.31 %	0.80 %	
17	1,836	0.42 %	0.26 %	0.80 %	
18	1,874	0.76 %	0.22 %	0.80 %	
19	1,992	0.55 %	0.19 %	0.80 %	
20	2,120	1.68 %	0.17 %	0.80 %	
21	2,015	1.18 %	0.13 %	0.80 %	
22	1,841	0.82 %	0.11 %	0.80 %	
23	1,613	(0.09)%	0.09 %	0.70 %	
24	1,454	0.71 %	0.06 %	0.70 %	
25	1,313	1.70 %	0.03 %	0.70 %	
26	1,248	0.98 %	0.00 %	0.70 %	
27	1,184	1.08 %	0.00 %	0.70 %	
28	1,153	0.87 %	0.00 %	0.70 %	
29	1,131	1.90 %	0.00 %	0.70 %	
30	1,026	3.65 %	0.00 %	0.70 %	
Total	79,992				

* Actual merit is actual total reduced by the estimated across-the-board increase of 4%.

TEACHERS

MERIT AND LONGEVITY PAY INCREASE GRAPH



SECTION F

POLICE

POLICE
AGE BASED WITHDRAWAL EXPERIENCE

*Summary of Male & Female Age-Based Withdrawal Experience
With 5 or More Years of Service*

Age	Withdrawals	Exposure	Crude Rates	Sample Rates*		Expected Withdrawals**	
				Old	New	Old	New
Under 20	-	-	N\A	0.0750	0.0400	-	-
20-24	-	4	0.0000	0.0640	0.0400	-	-
25-29	26	630	0.0413	0.0510	0.0400	31.0	25.0
30-34	106	2,325	0.0456	0.0410	0.0400	95.0	93.0
35-39	118	3,343	0.0353	0.0330	0.0400	111.0	134.0
40-44	132	3,536	0.0373	0.0300	0.0400	107.0	141.0
45-49	84	1,310	0.0641	0.0300	0.0400	40.0	52.0
50-54	74	773	0.0957	0.0200	0.0400	18.0	31.0
55-59	35	489	0.0716	0.0200	0.0400	11.0	20.0
Totals	575	12,410	0.0463	0.0333	0.0400	413.0	496.0
Ref				953	61		

* *Sample rates are taken from midpoint of age group.*

** *"Expected withdrawals - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected withdrawals - Old" is the sum of actual probabilities applied in the valuation.*

POLICE
SERVICE BASED WITHDRAWAL EXPERIENCE

*Summary of Male Service-Based Withdrawal Experience
With Less Than 5 Years of Service*

Service Index	Withdrawals	Exposure	Crude Rates	Sample Rates		Expected Withdrawals**	
				Old#	New	Old	New
1	288	969	0.2972	0.0509	0.3000	49.3	290.7
2	250	1,653	0.1512	0.0486	0.1500	80.3	248.0
3	122	1,286	0.0949	0.0445	0.0900	57.2	115.7
4	98	1,135	0.0863	0.0426	0.0600	48.4	68.1
5	91	1,080	0.0843	0.0407	0.0400	44.0	43.2
Totals	849	6,123	0.1387	0.0456	0.1251	279.2	765.7
Ref				1	7		

*Summary of Female Service-Based Withdrawal Experience
With Less Than 5 Years of Service*

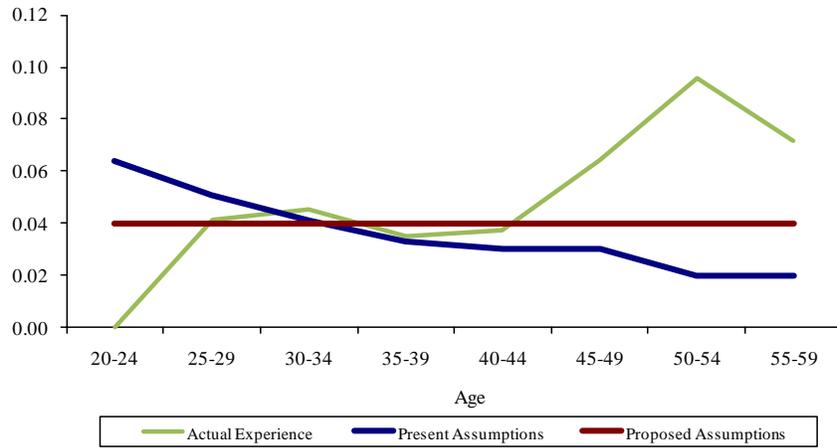
Service Index	Withdrawals	Exposure	Crude Rates	Sample Rates		Expected Withdrawals**	
				Old#	New	Old	New
1	114	242	0.4711	0.0483	0.4000	11.7	96.8
2	51	305	0.1672	0.0479	0.1700	14.6	51.9
3	39	249	0.1566	0.0442	0.1400	11.0	34.9
4	31	219	0.1416	0.0416	0.1100	9.1	24.1
5	29	199	0.1457	0.0397	0.0900	7.9	17.9
Totals	264	1,214	0.2175	0.0447	0.1858	54.3	225.6
Ref				1	233		

** "Expected withdrawals - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected withdrawals - Old" is the sum of actual probabilities applied in the valuation.

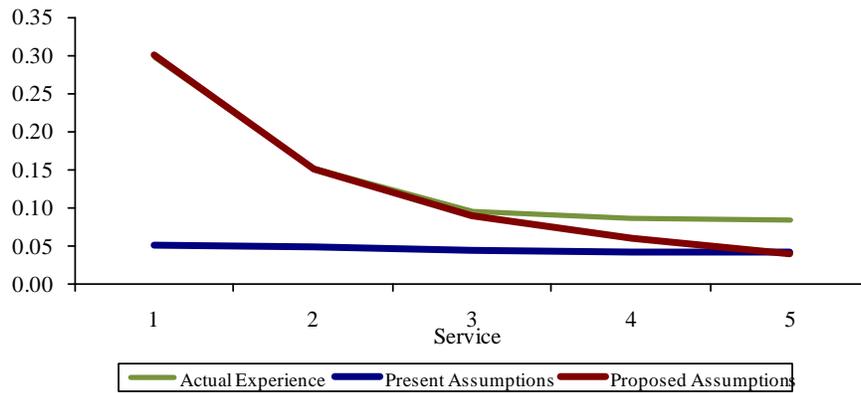
Based on expected withdrawals developed from valuation divided by exposure.

POLICE WITHDRAWAL GRAPHS

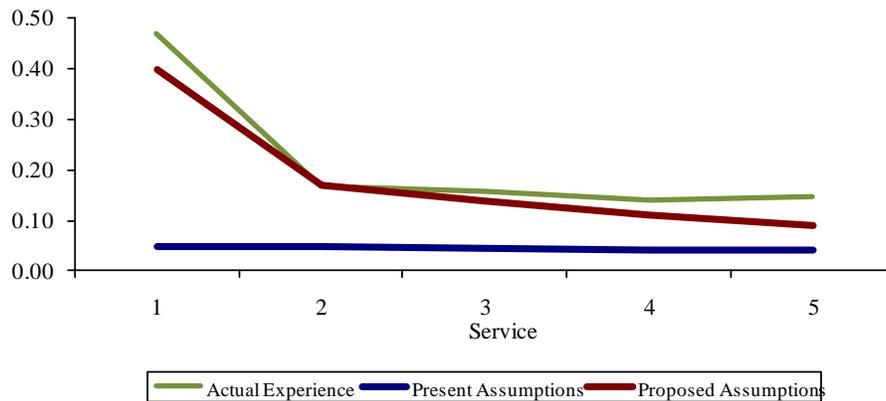
***Male & Female Age-Based Withdrawal Experience
With 5 or More Years of Service***



***Male Service-Based Withdrawal Experience
With Less Than 5 Years of Service***



***Female Service-Based Withdrawal Experience
With Less Than 5 Years of Service***



POLICE DISABILITY EXPERIENCE

Male & Female Ordinary Disability Experience

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 20	-	-	N\A	0.000040	0.000360	-	-
20-24	-	-	N\A	0.000070	0.000360	-	-
25-29	-	5	0.0000	0.000110	0.000360	-	-
30-34	-	544	0.0000	0.000170	0.000495	-	-
35-39	3	2,217	0.0014	0.000370	0.001125	1.0	3.0
40-44	5	2,865	0.0017	0.000920	0.002250	3.0	7.0
45-49	10	950	0.0105	0.001640	0.003825	2.0	4.0
50-54	5	507	0.0099	0.000860	0.005940	1.0	3.0
55-59	3	317	0.0095	0.007700	0.008640	2.0	3.0
Totals	26	7,405	0.0035	0.0012	0.0027	9.0	20.0
Ref				493	35		

* Sample rates are taken from midpoint of age group.

** "Expected disabilities - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Old" is the sum of actual probabilities applied in the valuation.

Male & Female Duty Disability Experience

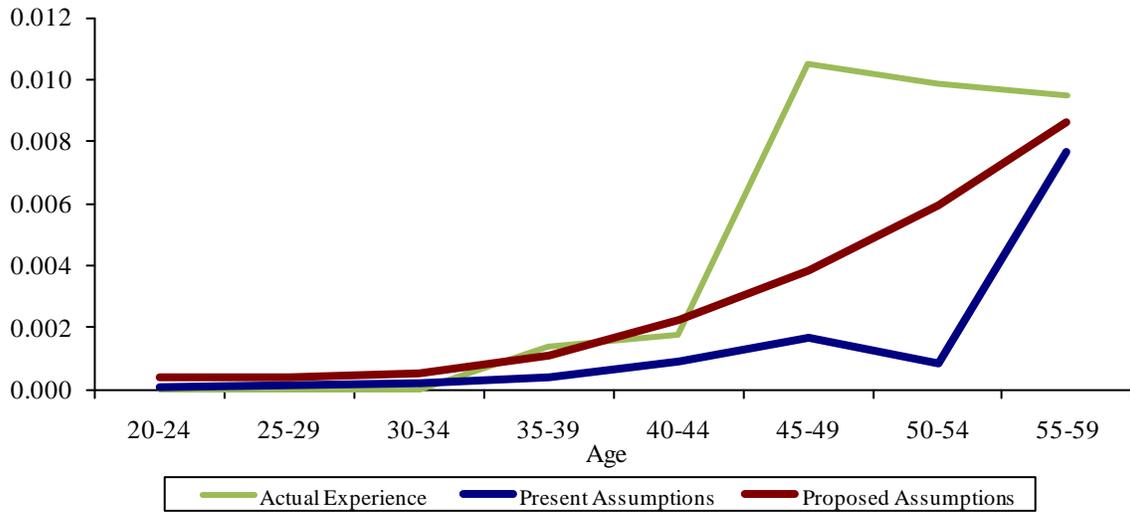
Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 20	-	3	0.0000	0.000100	0.000240	-	-
20-24	-	861	0.0000	0.000100	0.000240	-	-
25-29	1	3,131	0.0003	0.000100	0.000240	-	1.0
30-34	2	3,730	0.0005	0.000660	0.000330	3.0	1.0
35-39	2	4,376	0.0005	0.001700	0.000750	7.0	3.0
40-44	6	4,195	0.0014	0.002200	0.001500	9.0	6.0
45-49	3	1,732	0.0017	0.002700	0.002550	5.0	4.0
50-54	5	1,078	0.0046	0.003200	0.003960	3.0	4.0
55-59	2	641	0.0031	0.003700	0.005760	2.0	4.0
Totals	21	19,747	0.0011	0.0015	0.0012	29.0	23.0
Ref				494	35		

* Sample rates are taken from midpoint of age group.

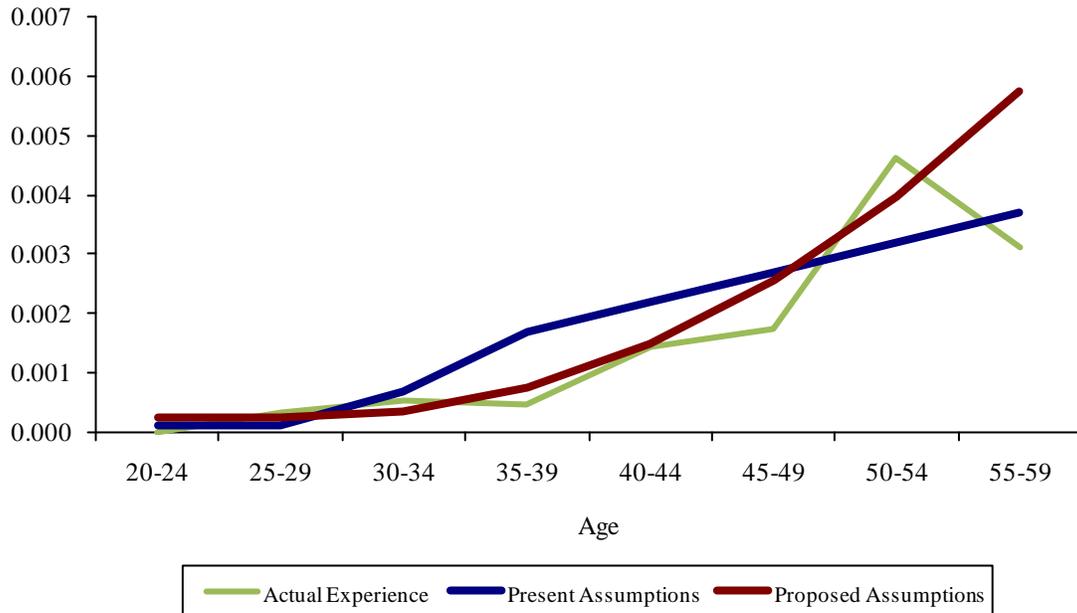
** "Expected disabilities - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Old" is the sum of actual probabilities applied in the valuation.

POLICE DISABILITY GRAPHS

Male & Female Ordinary Disability Experience



Male & Female Duty Disability Experience



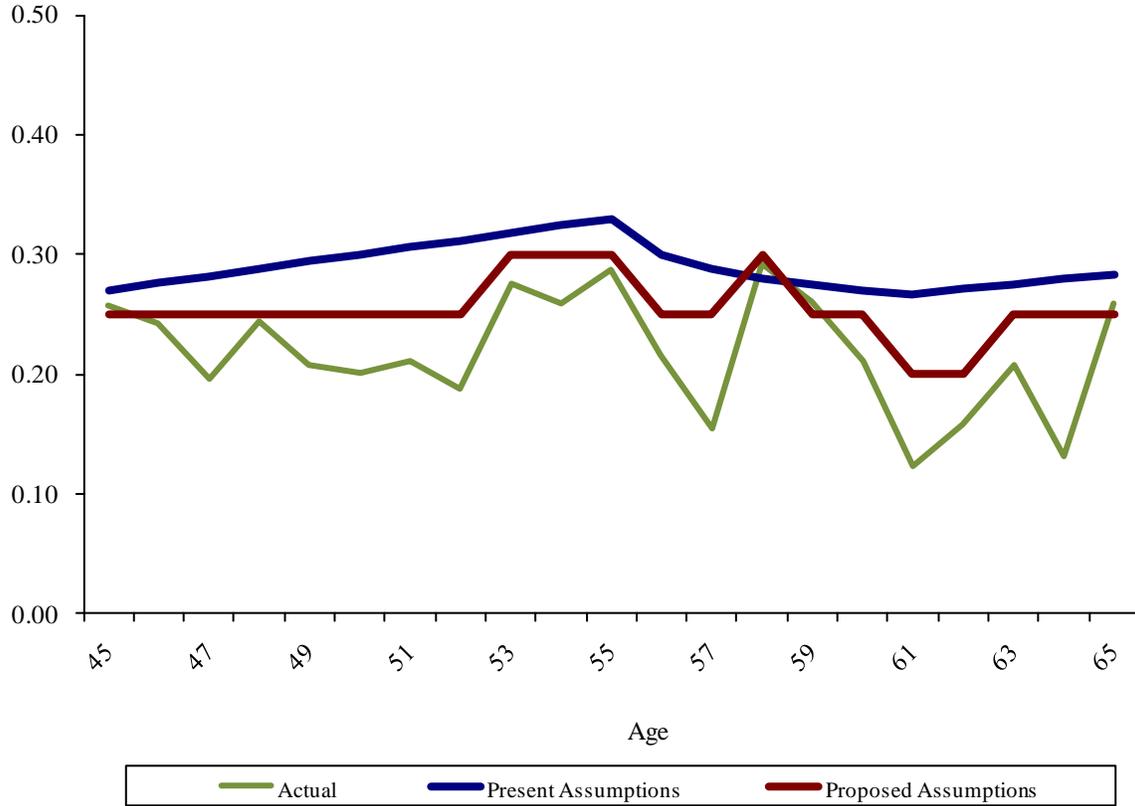
POLICE
MALE & FEMALE AGE-BASED RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
Under 45	1	-	N\A	N\A	N\A	-	-
45	82	319	0.2571	0.2700	0.2500	86	80
46	68	280	0.2429	0.2760	0.2500	77	70
47	49	251	0.1952	0.2820	0.2500	71	63
48	58	237	0.2447	0.2880	0.2500	68	59
49	42	202	0.2079	0.2940	0.2500	60	51
50	34	169	0.2012	0.3000	0.2500	51	42
51	29	138	0.2101	0.3060	0.2500	42	35
52	24	128	0.1875	0.3120	0.2500	40	32
53	30	109	0.2752	0.3180	0.3000	35	33
54	23	89	0.2584	0.3240	0.3000	29	27
55	23	80	0.2875	0.3300	0.3000	26	24
56	16	74	0.2162	0.3000	0.2500	22	19
57	9	58	0.1552	0.2875	0.2500	16	15
58	14	48	0.2917	0.2800	0.3000	14	14
59	13	50	0.2600	0.2750	0.2500	14	13
60	29	137	0.2117	0.2700	0.2500	36	34
61	11	90	0.1222	0.2667	0.2000	24	18
62	12	76	0.1579	0.2708	0.2000	21	15
63	12	58	0.2069	0.2750	0.2500	16	15
64	5	38	0.1316	0.2792	0.2500	11	10
65	7	27	0.2593	0.2833	0.2500	8	7
66	5	13	0.3846	0.2875	1.0000	4	13
67	1	8	0.1250	0.2917	1.0000	2	8
68	-	2	0.0000	0.2958	1.0000	1	2
69	-	1	0.0000	0.3000	1.0000	-	1
70 & Over	2	13	0.1538	1.0000	1.0000	13	3
Total	599	2,695	0.2223			787	702

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

POLICE MALE & FEMALE RETIREMENT GRAPHS

Male & Female Age-Based Retirement Experience



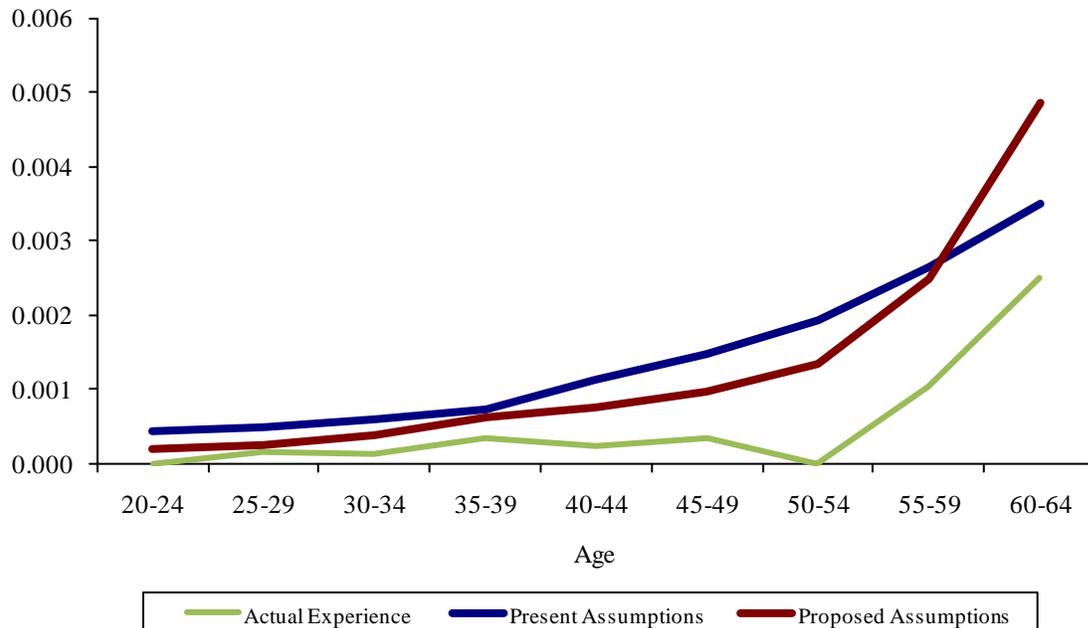
POLICE MALE & FEMALE PRE-RETIREMENT MORTALITY

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
Under 20	-	3	0.0000	0.0004	0.0002	-	-
20-24	-	861	0.0000	0.0004	0.0002	0.5	0.1
25-29	1	3,131	0.0002	0.0005	0.0003	1.9	0.8
30-34	1	3,730	0.0001	0.0006	0.0004	2.5	1.4
35-39	3	4,375	0.0003	0.0007	0.0006	3.7	2.5
40-44	2	4,195	0.0002	0.0011	0.0007	5.1	3.0
45-49	2	3,023	0.0003	0.0015	0.0010	4.7	2.8
50-54	-	1,723	0.0000	0.0019	0.0013	3.4	2.2
55-59	2	970	0.0010	0.0026	0.0025	2.6	2.3
60-64	2	400	0.0025	0.0035	0.0049	1.3	1.8
65-69	-	51	0.0000	0.0040	0.0093	0.2	0.4
70-74	1	-	N/A	0.0040	0.0151	-	-
Totals	14	22,462	0.0003	0.0006	0.0004	25.9	17.3
Ref				494	454		

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Male & Female Age-Based Pre-Retirement Mortality Experience

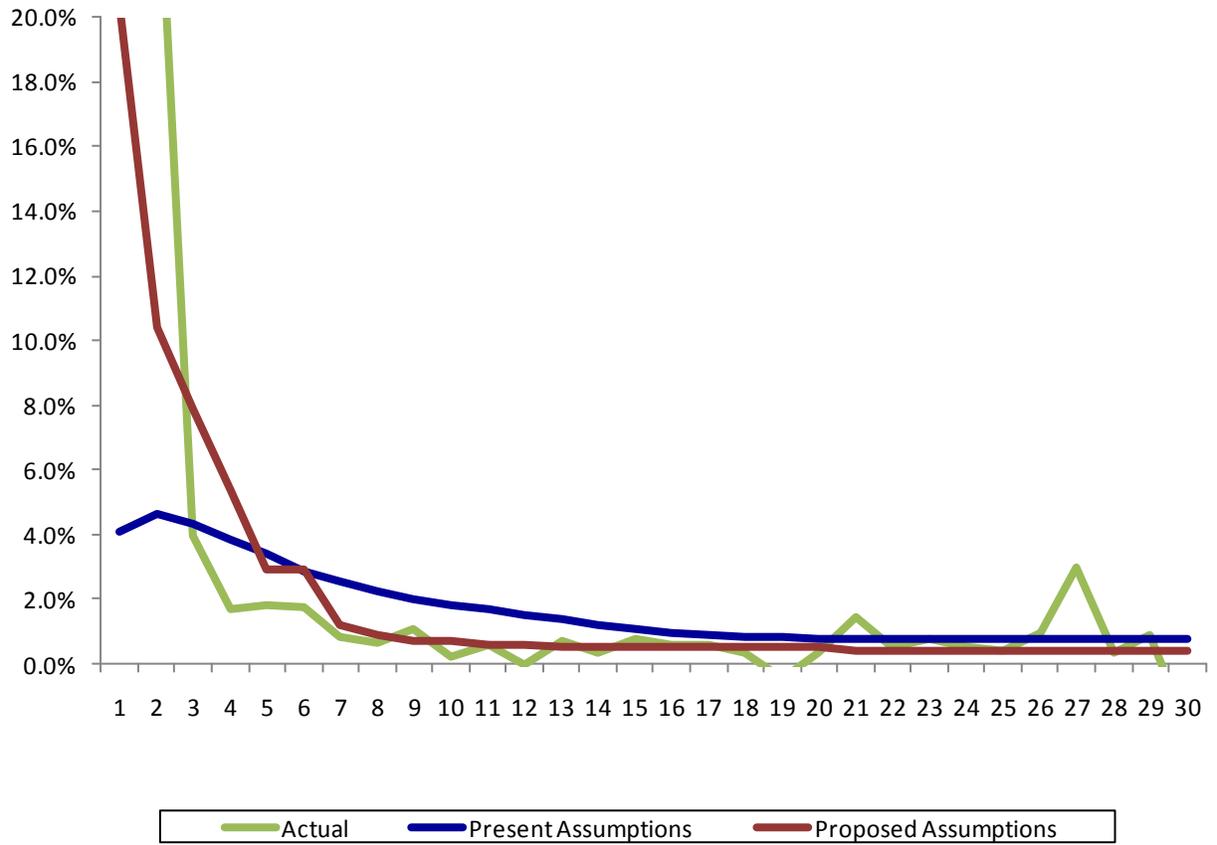


POLICE
MERIT AND LONGEVITY PAY INCREASE

Service		Merit/Seniority % Increase		
		Actual*	Expected	
			Old	New
Index	Number			
1	683	84.00 %	4.11 %	20.40 %
2	1,589	25.95 %	4.63 %	10.40 %
3	1,351	3.94 %	4.36 %	7.90 %
4	1,213	1.69 %	3.87 %	5.40 %
5	1,140	1.80 %	3.42 %	2.90 %
6	1,146	1.75 %	2.87 %	2.90 %
7	1,080	0.81 %	2.54 %	1.20 %
8	1,044	0.64 %	2.24 %	0.90 %
9	963	1.08 %	2.02 %	0.70 %
10	844	0.21 %	1.79 %	0.70 %
11	809	0.58 %	1.67 %	0.60 %
12	744	(0.06)%	1.52 %	0.60 %
13	700	0.68 %	1.39 %	0.50 %
14	660	0.37 %	1.21 %	0.50 %
15	608	0.79 %	1.07 %	0.50 %
16	559	0.58 %	0.96 %	0.50 %
17	539	0.56 %	0.91 %	0.50 %
18	551	0.33 %	0.86 %	0.50 %
19	577	(0.45)%	0.81 %	0.50 %
20	553	0.35 %	0.78 %	0.50 %
21	464	1.44 %	0.76 %	0.40 %
22	392	0.51 %	0.76 %	0.40 %
23	297	0.75 %	0.75 %	0.40 %
24	237	0.52 %	0.75 %	0.40 %
25	199	0.43 %	0.76 %	0.40 %
26	178	0.97 %	0.75 %	0.40 %
27	149	3.00 %	0.75 %	0.40 %
28	115	0.37 %	0.75 %	0.40 %
29	98	0.92 %	0.75 %	0.40 %
30	73	(2.02)%	0.75 %	0.40 %
Total	19,555			

* Actual merit is actual total reduced by the estimated across-the-board increase of 4%.

POLICE MERIT AND LONGEVITY PAY INCREASE GRAPH



SECTION G

FIRE

FIRE
MALE & FEMALE WITHDRAWAL EXPERIENCE

*Summary of Male & Female Age-Based Withdrawal Experience
With 5 or More Years of Service*

Age	Withdrawals	Exposure	Crude Rates	Sample Rates*		Expected Withdrawals**	
				Old	New	Old	New
Under 20	-	-	N\A	0.0100	0.0150	-	-
20-24	-	-	N\A	0.0100	0.0150	-	-
25-29	4	231	0.0173	0.0100	0.0150	2.4	3.6
30-34	4	657	0.0061	0.0100	0.0150	7.1	10.3
35-39	20	1,256	0.0159	0.0100	0.0150	13.1	20.3
40-44	27	1,638	0.0165	0.0100	0.0150	16.6	26.5
45-49	19	549	0.0346	0.0100	0.0150	5.8	9.4
50-54	13	287	0.0453	0.0100	0.0150	3.1	4.7
55-59	5	78	0.0641	0.0100	0.0150	0.9	1.2
Totals	92	4,696	0.0196	0.0104	0.0162	49.0	76.0
Ref				151	151		

*Summary of Male & Female Service-Based Withdrawal Experience
With Less Than 5 Years of Service*

Service Index	Withdrawals	Exposure	Crude Rates	Sample Rates		Expected Withdrawals**	
				Old#	New	Old	New
1	27	241	0.1120	0.0100	0.0800	2.4	19.3
2	29	450	0.0644	0.0100	0.0600	4.5	27.0
3	15	425	0.0353	0.0100	0.0450	4.3	19.1
4	21	433	0.0485	0.0100	0.0300	4.3	13.0
5	10	448	0.0223	0.0100	0.0200	4.5	9.0
Totals	102	1,997	0.0511	0.0100	0.0438	20.0	87.4
Ref				1	13		

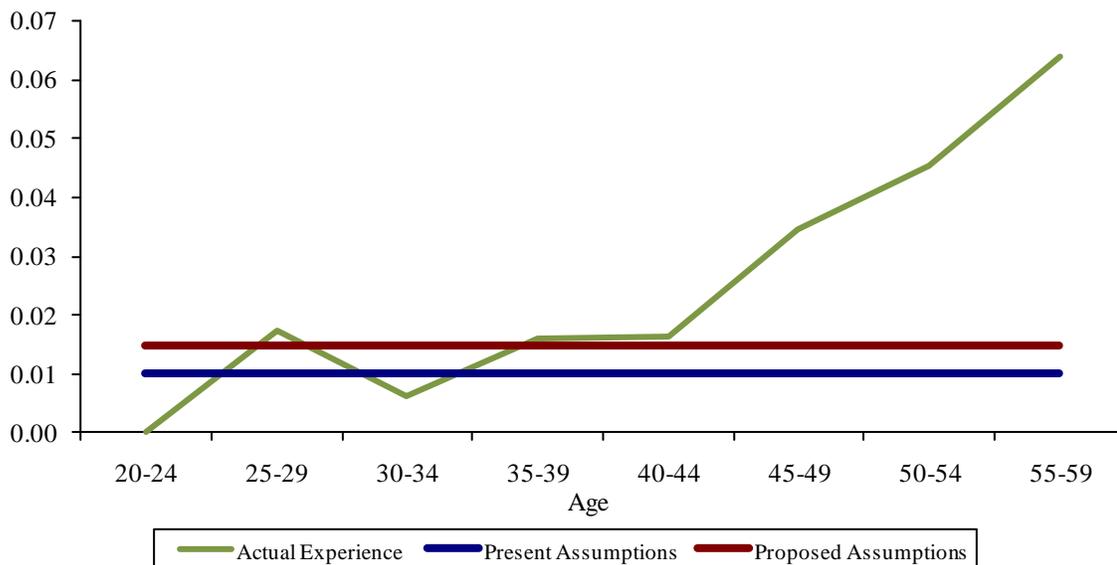
* Sample rates are taken from midpoint of age group.

** "Expected withdrawals - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected withdrawals - Old" is the sum of actual probabilities applied in the valuation.

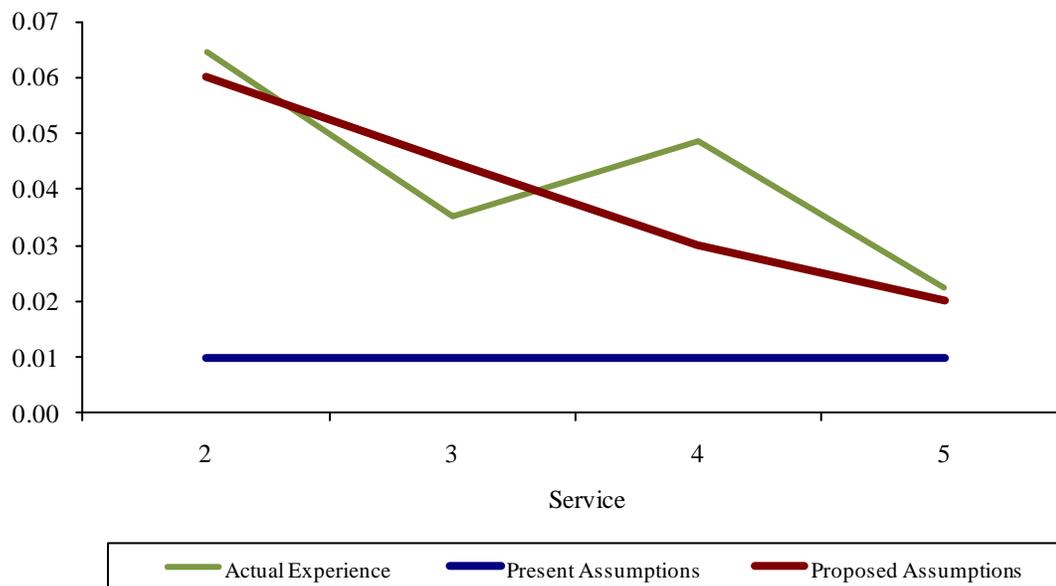
Based on expected withdrawals developed from valuation divided by exposure.

FIRE WITHDRAWAL GRAPHS

*Age-Based Withdrawal Experience
With 5 or More Years of Service*



*Male Service-Based Withdrawal Experience
With Less Than 5 Years of Service*



FIRE

MALE & FEMALE DISABILITY EXPERIENCE

Ordinary Disability Experience

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 20	-	-	N\A	0.00000	0.00040	-	-
20-24	-	-	N\A	0.00020	0.00040	-	-
25-29	-	2	0.00000	0.00020	0.00048	-	-
30-34	-	175	0.00000	0.00020	0.00056	-	0.1
35-39	2	709	0.00282	0.00020	0.00072	0.1	0.5
40-44	-	1,268	0.00000	0.00020	0.00160	0.2	2.1
45-49	3	389	0.00771	0.00020	0.00304	0.1	1.2
50-54	2	200	0.01000	0.00020	0.00792	-	1.5
55-59	-	63	0.00000	0.00020	0.01496	-	0.9
Totals	7	2,806	0.00249	0.00014	0.00225	0.4	6.3
Ref				274	2		

* Sample rates are taken from midpoint of age group.

** "Expected disabilities - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Old" is the sum of actual probabilities applied in the valuation.

Duty Disability Experience

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 20	-	-	N\A	0.00050	0.00023	-	-
20-24	-	237	0.00000	0.00050	0.00023	0.1	0.1
25-29	-	773	0.00000	0.00058	0.00023	0.4	0.2
30-34	-	1,080	0.00000	0.00078	0.00027	0.8	0.3
35-39	-	1,651	0.00000	0.00134	0.00042	2.3	0.7
40-44	-	1,856	0.00000	0.00220	0.00104	4.0	1.9
45-49	1	671	0.00149	0.00270	0.00186	1.8	1.3
50-54	1	329	0.00304	0.00320	0.00308	1.0	0.9
55-59	1	96	0.01042	0.00370	0.00649	0.3	0.6
Totals	3	6,693	0.00045	0.00160	0.00090	10.7	6.0
Ref				496	7		

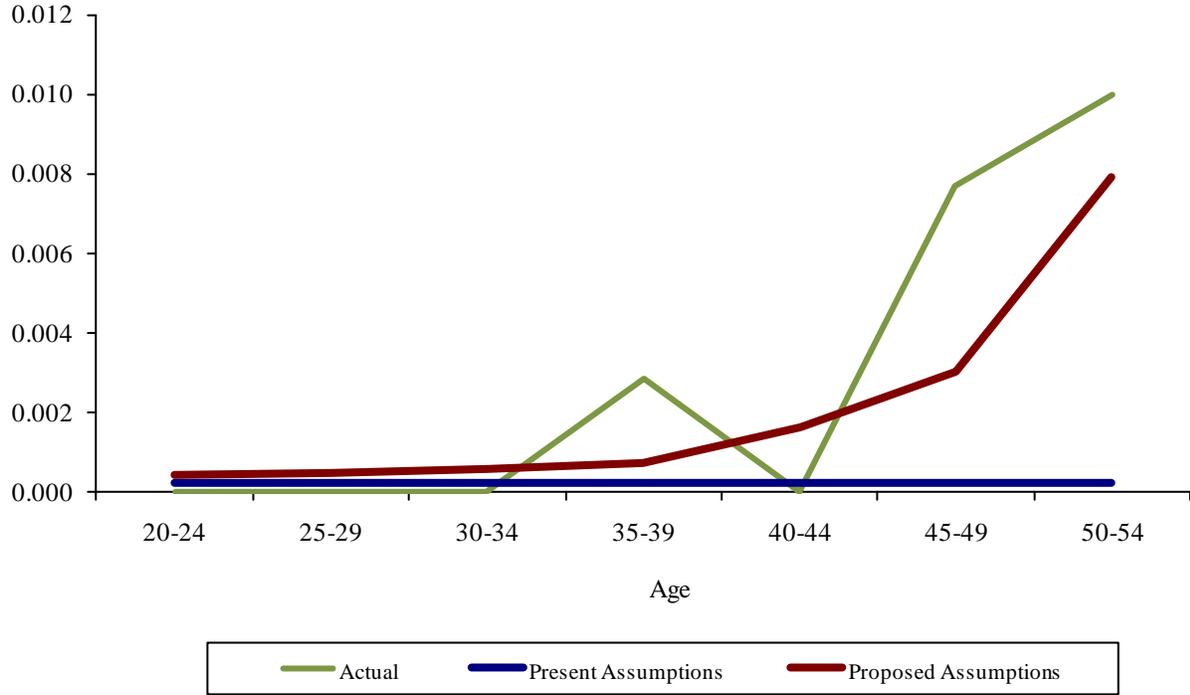
* Sample rates are taken from midpoint of age group.

** "Expected disabilities - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Old" is the sum of actual probabilities applied in the valuation.

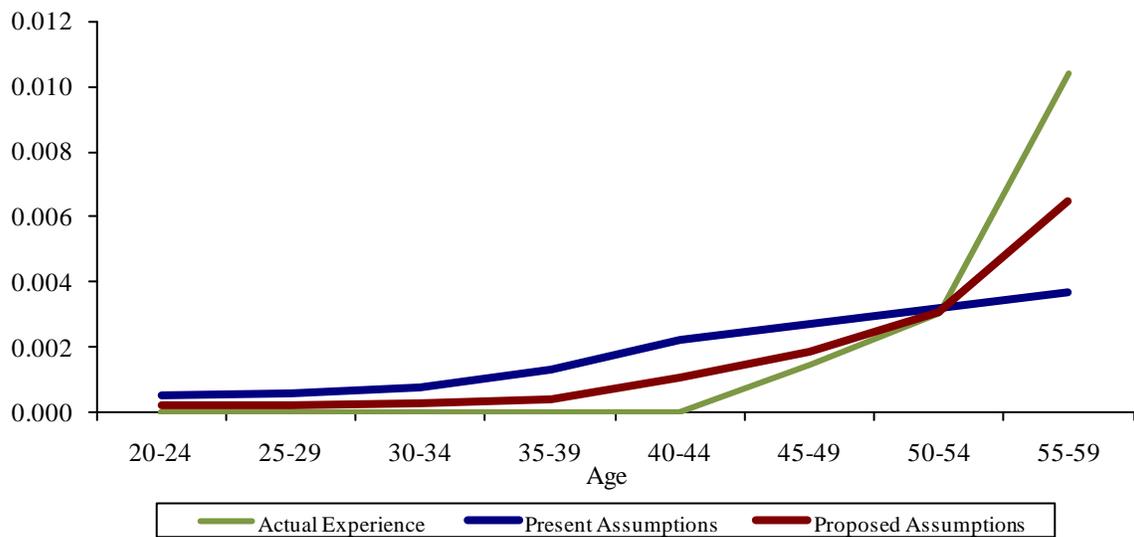
FIRE

MALE & FEMALE DISABILITY EXPERIENCE GRAPHS

Ordinary Disability Experience



Duty Disability Experience



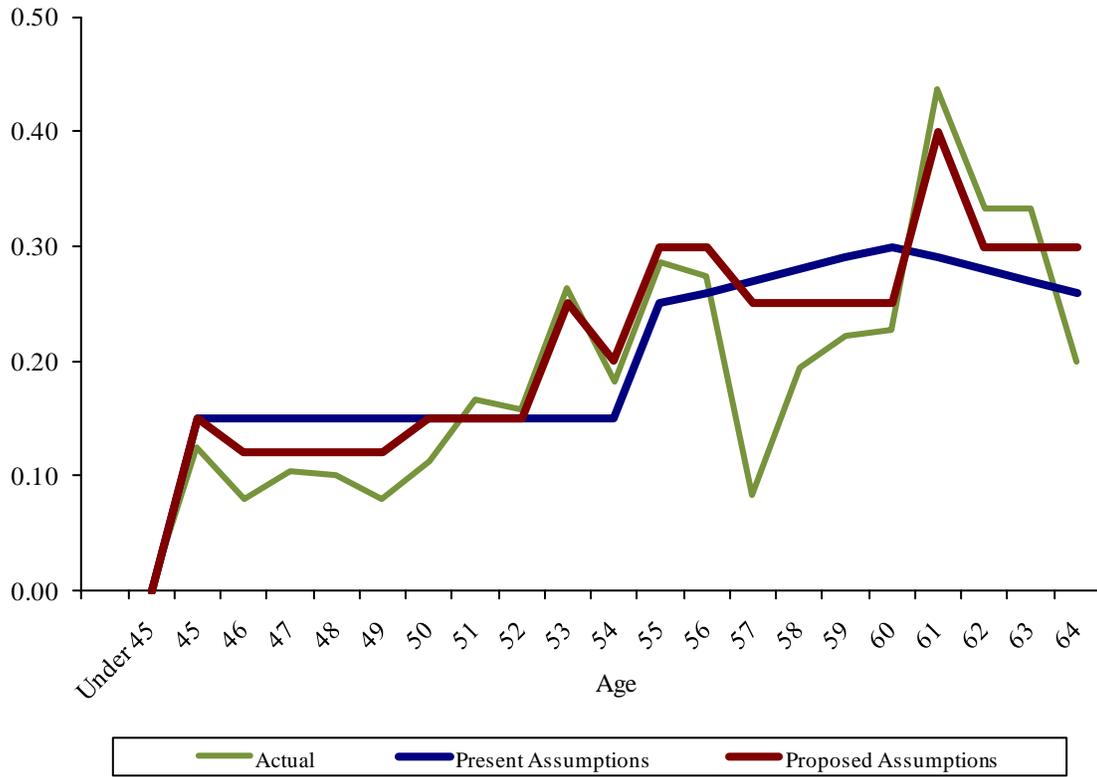
FIRE
MALE & FEMALE AGE-BASED RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
Under 45	-	-	N\A	N\A	N\A	-	-
45	18	145	0.1241	0.1500	0.1500	22.2	22.3
46	12	150	0.0800	0.1500	0.1200	22.2	18.3
47	15	143	0.1049	0.1500	0.1200	21.2	17.3
48	15	148	0.1014	0.1500	0.1200	22.2	18.3
49	11	137	0.0803	0.1500	0.1200	20.2	16.3
50	14	125	0.1120	0.1500	0.1500	19.2	19.3
51	19	114	0.1667	0.1500	0.1500	17.2	17.3
52	15	95	0.1579	0.1500	0.1500	14.0	14.0
53	24	91	0.2637	0.1500	0.2500	13.5	22.8
54	14	77	0.1818	0.1500	0.2000	11.3	15.5
55	20	70	0.2857	0.2500	0.3000	18.0	21.0
56	14	51	0.2745	0.2600	0.3000	13.0	13.0
57	3	36	0.0833	0.2700	0.2500	10.0	9.0
58	6	31	0.1935	0.2800	0.2500	9.0	8.0
59	4	18	0.2222	0.2900	0.2500	5.0	5.0
60	5	22	0.2273	0.3000	0.2500	6.1	5.4
61	7	16	0.4375	0.2900	0.4000	4.2	6.4
62	3	9	0.3333	0.2800	0.3000	3.0	3.0
63	2	6	0.3333	0.2700	0.3000	2.0	2.0
64	1	5	0.2000	0.2600	0.3000	1.0	2.0
65	-	5	0.0000	0.2500	1.0000	1.0	5.0
66	1	5	0.2000	0.2500	1.0000	1.0	5.0
67	1	5	0.2000	0.2500	1.0000	1.0	5.0
68	-	1	0.0000	0.2500	1.0000	-	1.0
69	-	1	0.0000	0.2500	1.0000	-	1.0
70 and Over	-	-	N\A	1.0000	1.0000	-	-
Totals	224	1,506	0.1487			257.5	273.2

* "Expected retirements - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Old" is the sum of actual probabilities applied in the valuation.

FIRE MALE & FEMALE RETIREMENT GRAPHS

Age-Based Retirement Experience



FIRE

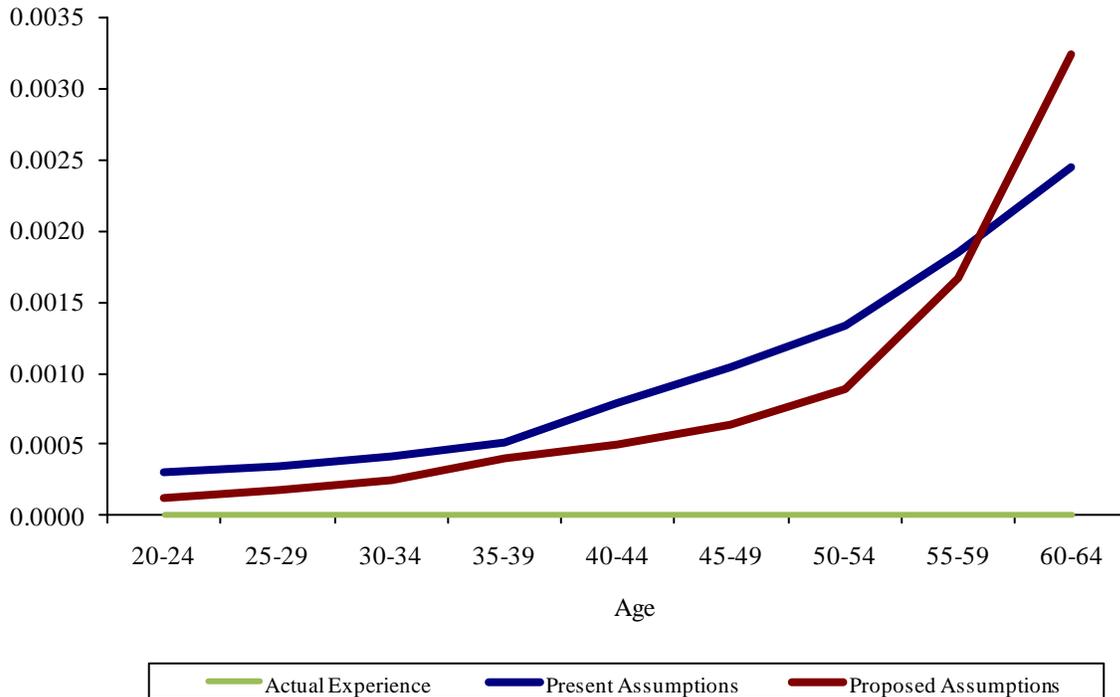
MALE & FEMALE PRE-RETIREMENT MORTALITY

Age	Deaths#	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
Under 20	-	-	N\A	0.0000	0.0001	-	-
20-24	-	237	0.0000	0.0003	0.0001	0.1	-
25-29	-	773	0.0000	0.0003	0.0002	0.4	0.1
30-34	-	1,080	0.0000	0.0004	0.0003	0.6	0.3
35-39	-	1,651	0.0000	0.0005	0.0004	1.2	0.6
40-44	-	1,856	0.0000	0.0008	0.0005	1.9	0.9
45-49	-	1,393	0.0000	0.0010	0.0006	1.7	0.9
50-54	-	830	0.0000	0.0013	0.0009	1.2	0.7
55-59	-	308	0.0000	0.0019	0.0017	0.6	0.5
60-64	-	58	0.0000	0.0025	0.0032	0.1	0.2
65-69	-	17	0.0000	0.0028	0.0062	0.1	0.1
70-74	-	-	N\A	0.0028	0.0101	-	-
75 and over	-	-	N\A	0.0028	0.0181	-	-
Totals	-	8,203	0.0000	0.0010	0.0005	7.9	4.3
Ref				496	454		

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Age-Based Pre-Retirement Mortality Experience



Data showed 4 actual deaths during the period. None resulted in survivor annuities being paid.

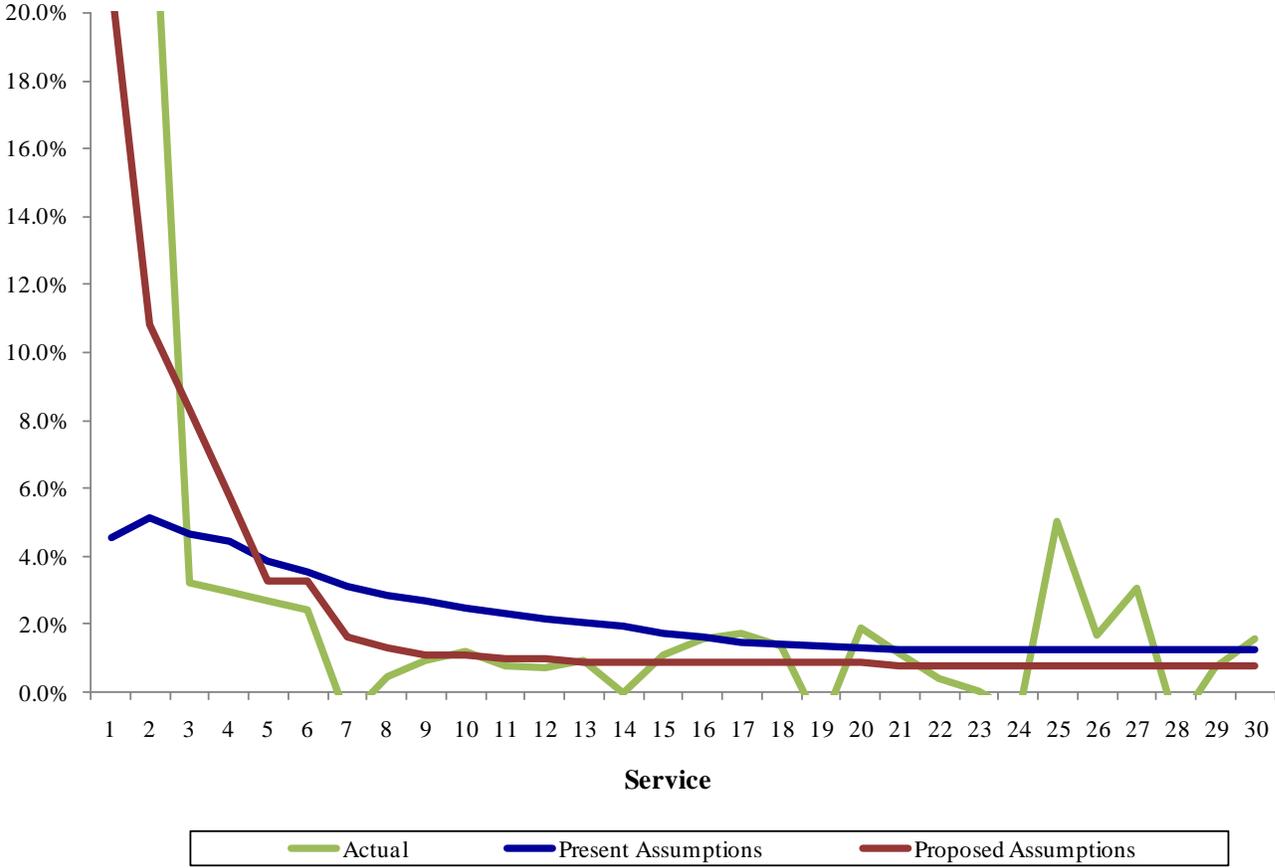
FIRE
MERIT AND LONGEVITY PAY INCREASES

Service Index Number		Merit/Seniority % Increase		
		Actual	Expected	
			Old	New
1	197	96.21 %	4.55 %	20.80 %
2	414	26.30 %	5.15 %	10.80 %
3	408	3.22 %	4.68 %	8.30 %
4	407	2.97 %	4.43 %	5.80 %
5	441	2.69 %	3.87 %	3.30 %
6	457	2.40 %	3.54 %	3.30 %
7	444	(0.76)%	3.12 %	1.60 %
8	426	0.48 %	2.84 %	1.30 %
9	373	0.91 %	2.68 %	1.10 %
10	318	1.20 %	2.48 %	1.10 %
11	278	0.76 %	2.33 %	1.00 %
12	226	0.72 %	2.16 %	1.00 %
13	201	0.91 %	2.03 %	0.90 %
14	195	(0.03)%	1.94 %	0.90 %
15	187	1.10 %	1.74 %	0.90 %
16	195	1.58 %	1.61 %	0.90 %
17	216	1.71 %	1.48 %	0.90 %
18	243	1.33 %	1.40 %	0.90 %
19	264	(1.02)%	1.35 %	0.90 %
20	273	1.90 %	1.31 %	0.90 %
21	248	1.12 %	1.27 %	0.80 %
22	237	0.42 %	1.25 %	0.80 %
23	205	0.06 %	1.25 %	0.80 %
24	155	(0.69)%	1.24 %	0.80 %
25	134	5.02 %	1.25 %	0.80 %
26	118	1.68 %	1.25 %	0.80 %
27	107	3.05 %	1.25 %	0.80 %
28	85	(0.98)%	1.25 %	0.80 %
29	68	0.73 %	1.25 %	0.80 %
30	56	1.60 %	1.25 %	0.80 %
Total	7,576			

* Actual merit is actual total reduced by the estimated across-the-board increase of 3%.

FIRE

MERIT AND LONGEVITY PAY INCREASES



SECTION H

NHRS RETIREE MORTALITY

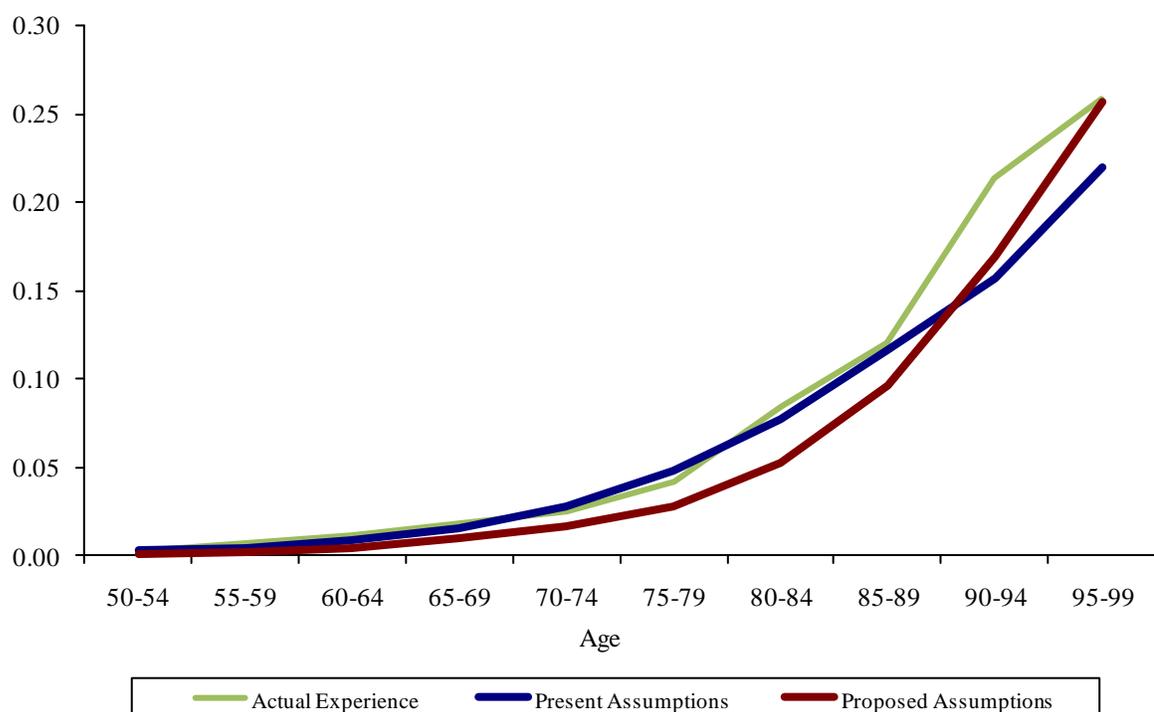
HEALTHY MALE RETIRANT MORTALITY EXPERIENCE

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
50-54	6	2,322	0.002584	0.002821	0.001487	6.55	5
55-59	31	4,523	0.006854	0.004705	0.002469	21.28	17
60-64	108	8,819	0.012246	0.008577	0.004887	75.64	64
65-69	158	8,479	0.018634	0.016068	0.009607	136.24	109
70-74	180	7,032	0.025597	0.028328	0.016413	199.20	151
75-79	220	5,290	0.041588	0.047871	0.028538	253.24	204
80-84	269	3,192	0.084273	0.077541	0.052647	247.51	226
85-89	185	1,539	0.120208	0.116530	0.096240	179.34	191
90-94	100	468	0.213675	0.157308	0.169280	73.62	94
95-99	22	85	0.258824	0.219529	0.256992	18.66	25
100-104	3	11	0.272727	0.312727	0.337730	3.44	4
105-109	-	-	N/A		0.397886	-	-
Other	5	1,002	0.004990				-
Totals	1,287	42,762	0.030097	0.028407	0.025490	1,215	1,090

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Age-Based Healthy Male Retirant Mortality Experience



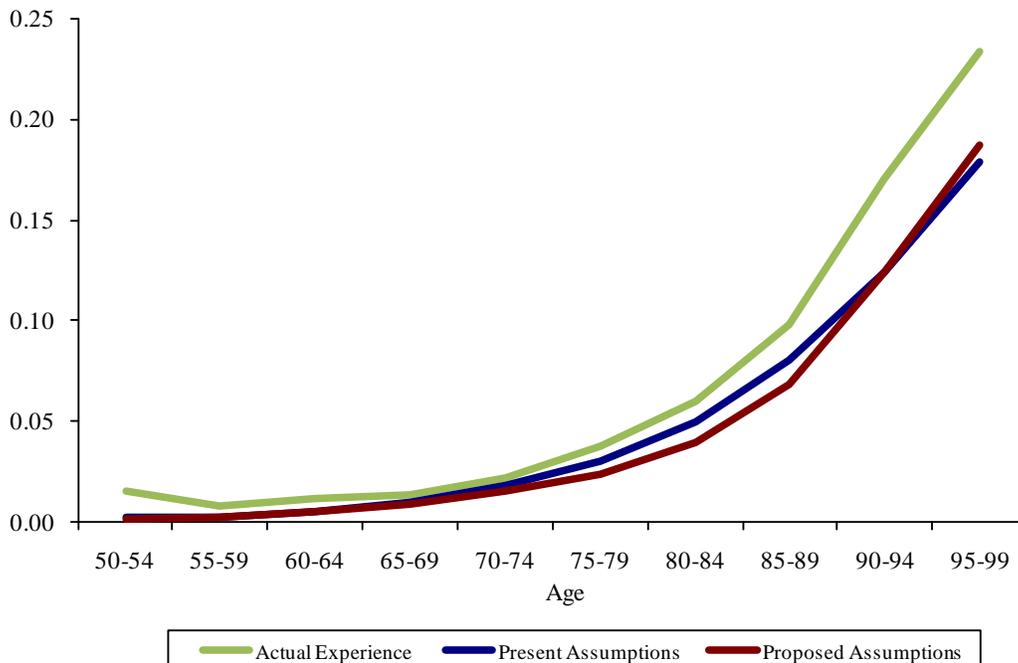
HEALTHY FEMALE RETIRANT MORTALITY EXPERIENCE

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
50-54	11	716	0.015363	0.001844	0.001189	1.32	1
55-59	30	3,793	0.007909	0.002681	0.002314	10.17	14
60-64	132	11,143	0.011846	0.004710	0.004573	52.48	75
65-69	140	10,825	0.012933	0.009870	0.008780	106.84	125
70-74	171	7,940	0.021537	0.018360	0.015145	145.78	151
75-79	211	5,572	0.037868	0.029995	0.023935	167.13	172
80-84	239	4,020	0.059453	0.049550	0.039866	199.19	208
85-89	247	2,526	0.097783	0.080499	0.068664	203.34	232
90-94	198	1,162	0.170396	0.123528	0.124002	143.54	176
95-99	95	407	0.233415	0.178428	0.186875	72.62	85
100-104	28	67	0.417910	0.252836	0.232763	16.94	17
105-109	1	1	1.000000	0.000000	0.293116	-	0
Other	8	267	0.029963			-	-
Totals	1,511	48,439	0.031194	0.023108	0.025936	1,119	1,256

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Age-Based Healthy Female Retirant Mortality Experience



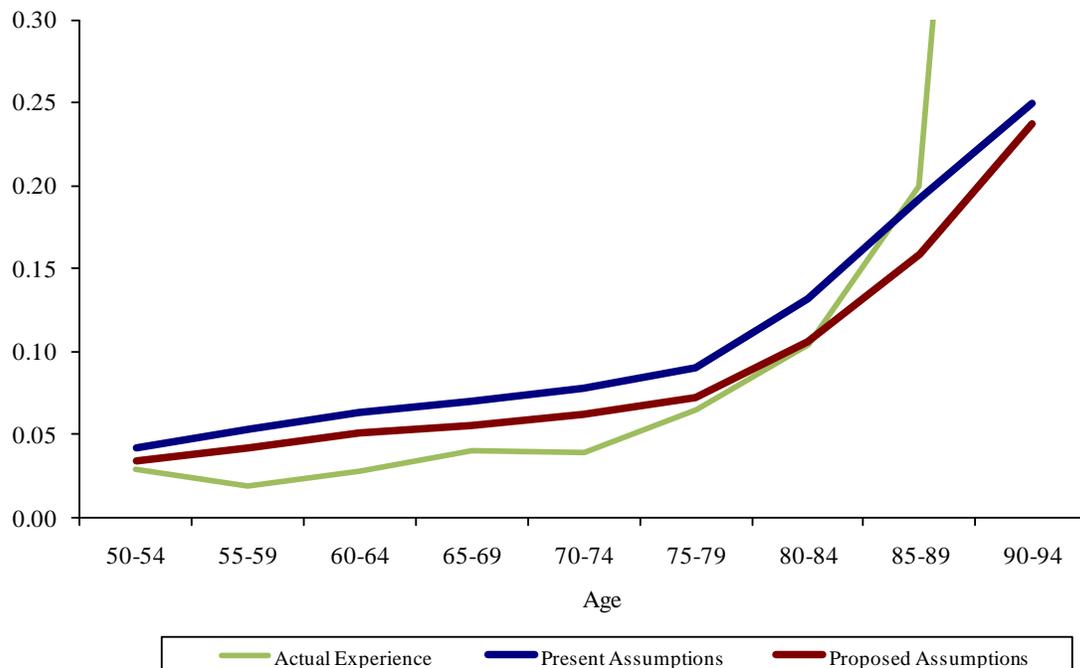
IMPAIRED MALE MORTALITY EXPERIENCE GROUP I

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
50-54	8	278	0.028777	0.042446	0.033600	11.80	10
55-59	9	463	0.019438	0.053369	0.042480	24.71	20
60-64	12	431	0.027842	0.063805	0.051440	27.50	22
65-69	14	346	0.040462	0.069653	0.055760	24.10	19
70-74	8	202	0.039604	0.077475	0.062080	15.65	13
75-79	8	124	0.064516	0.090242	0.072640	11.19	9
80-84	5	48	0.104167	0.132292	0.105760	6.35	5
85-89	3	15	0.200000	0.192667	0.158400	2.89	2
90-94	1	1	1.000000	0.250000	0.237760	0.25	-
95-99	-	-	N\A		0.356640	-	-
100-104	-	-	N\A		0.534960	-	-
105-109	-	-	N\A		0.800000	-	-
Other	2	247	0.008097				-
Totals	70	2,155	0.032483	0.057745	0.046404	124	100

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Age Based Impaired Male Mortality Experience Group I



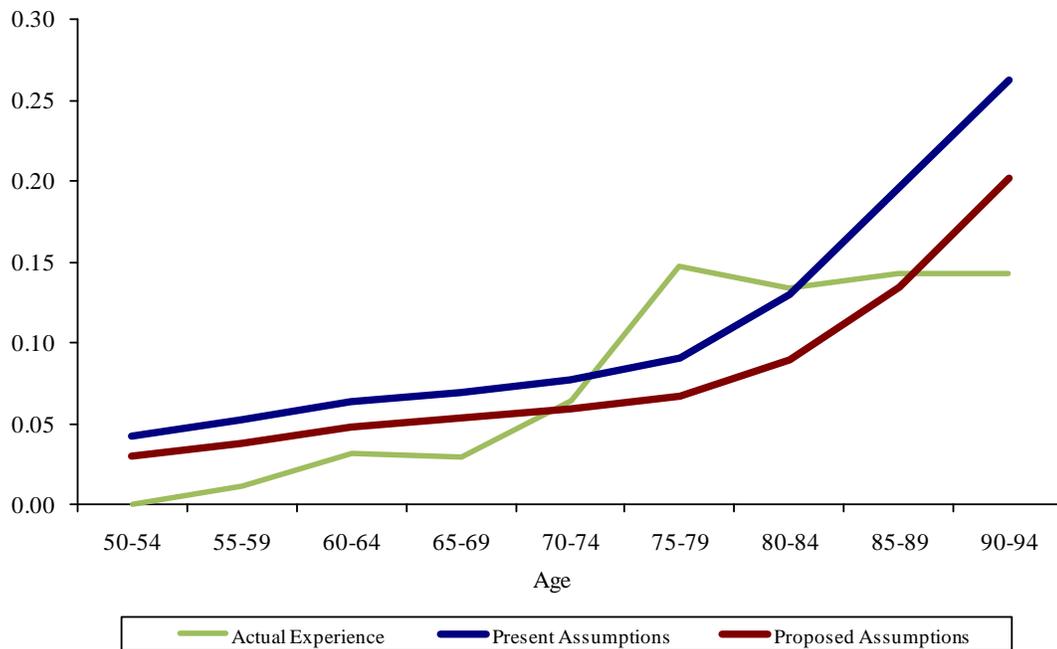
IMPAIRED MALE MORTALITY EXPERIENCE GROUP II

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
50-54	-	279	0.000000	0.042294	0.030640	11.80	10
55-59	4	333	0.012012	0.053093	0.038560	17.68	14
60-64	11	349	0.031519	0.063954	0.048240	22.32	18
65-69	8	275	0.029091	0.069673	0.054240	19.16	15
70-74	10	154	0.064935	0.077597	0.059120	11.95	10
75-79	17	115	0.147826	0.090957	0.067360	10.46	9
80-84	7	52	0.134615	0.130000	0.090240	6.76	6
85-89	6	42	0.142857	0.196905	0.134480	8.27	7
90-94	1	7	0.142857	0.262857	0.202000	1.84	2
95-99	2	3	0.666667	0.443333	0.303120	1.33	1
100-104	-	-	N\A		0.454720	-	-
105-109	-	-	N\A		0.682160	-	-
Other	3	362	0.008287				-
Totals	69	1,971	0.035008	0.056606	0.046677	112	92

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Age-Based Impaired Male Mortality Experience Group II



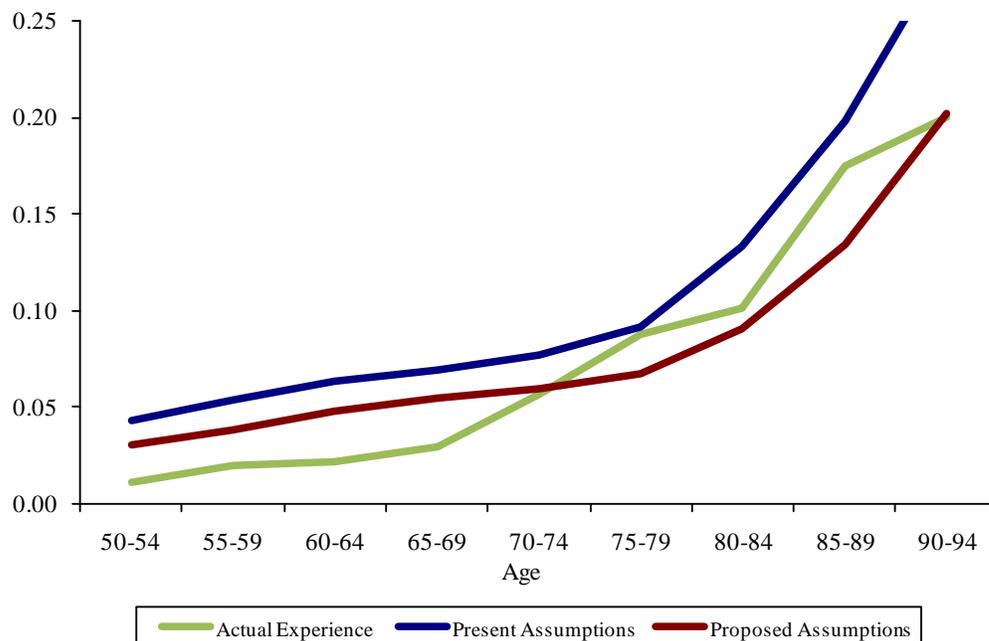
IMPAIRED FEMALE MORTALITY EXPERIENCE GROUP I

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
50-54	4	373	0.010724	0.042788	0.030640	15.96	13
55-59	12	613	0.019576	0.053214	0.038560	32.62	27
60-64	12	549	0.021858	0.063698	0.048240	34.97	28
65-69	11	374	0.029412	0.069572	0.054240	26.02	21
70-74	10	178	0.056180	0.077247	0.059120	13.75	11
75-79	11	126	0.087302	0.091905	0.067360	11.58	9
80-84	8	79	0.101266	0.133165	0.090240	10.52	9
85-89	11	63	0.174603	0.198413	0.134480	12.50	10
90-94	3	15	0.200000	0.288000	0.202000	4.32	4
95-99	3	8	0.375000	0.496250	0.303120	3.97	3
100-104	1	2	0.500000	0.310000	0.454720	0.62	1
105-109	-	-	N/A		0.682160	-	-
Other	6	352	0.017045			11	-
Totals	92	2,732	0.033675	0.065092	0.049780	178	136

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Age-Based Impaired Female Mortality Experience Group I



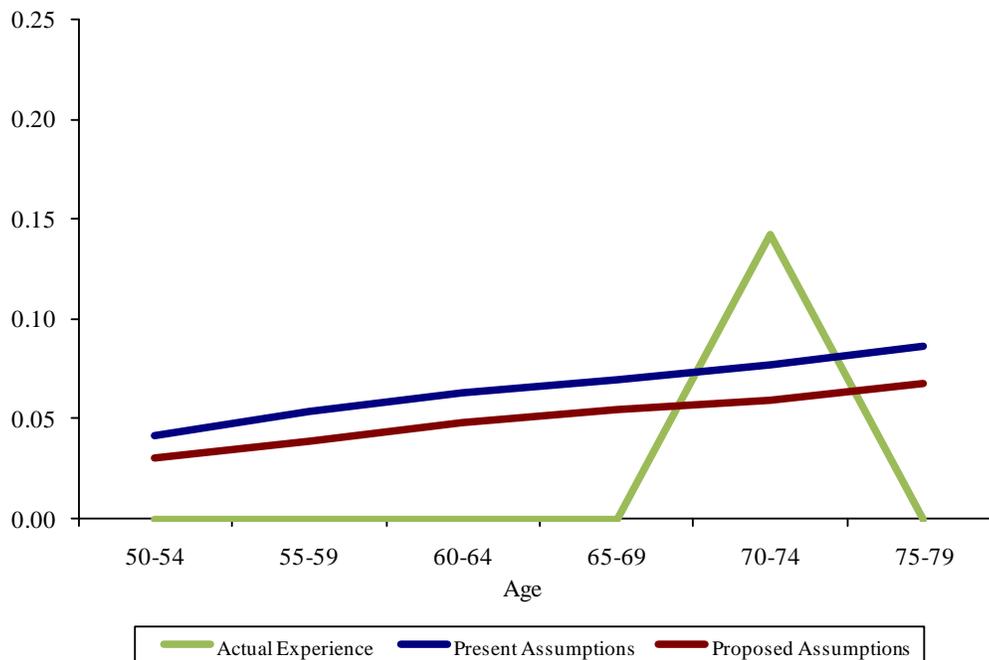
IMPAIRED FEMALE MORTALITY EXPERIENCE GROUP II

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
50-54	-	36	0.000000	0.041389	0.030640	1.49	1
55-59	-	47	0.000000	0.054043	0.038560	2.54	2
60-64	-	42	0.000000	0.062857	0.048240	2.64	2
65-69	-	9	0.000000	0.070000	0.054240	0.63	1
70-74	1	7	0.142857	0.077143	0.059120	0.54	-
75-79	-	3	0.000000	0.086667	0.067360	0.26	-
80-84	-	-	N/A		0.090240	-	-
85-89	-	-	N/A		0.134480	-	-
90-94	-	-	N/A		0.202000	-	-
95-99	-	-	N/A		0.303120	-	-
100-104	-	-	N/A		0.454720	-	-
105-109	-	-	N/A		0.682160	-	-
Other	-	36	0.000000			1.0	-
Totals	1	180	0.005556	0.050556	0.033333	9.1	6.0

* Sample rates are taken from midpoint of age group.

** "Expected deaths - New" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Old" is the sum of actual probabilities applied in the valuation.

Age-Based Impaired Female Mortality Experience Group II



SECTION I

OTHER ASSUMPTIONS/METHODS

END OF CAREER PAYS SUMMARY OF DATA

Retiree Data as of June 30, 2010

	Employees	Teachers	Police	Fire	Total
Number	12,802	9,087	2,702	1,254	25,845
Pension Payroll	\$156,291,587	\$194,231,415	\$88,326,595	\$43,205,470	\$482,055,067
Average Age	70.5	68.5	62.5	65.0	68.7
Average Pay	\$12,208	\$21,375	\$32,689	\$34,454	\$18,652

Retiree Data Available For Load Analysis as of June 30, 2010

	Employees	Teachers	Police	Fire	Total
(a) No. of members retiring in 5 yr. period ending 6/30/10	4,063	3,615	765	288	8,731
(b) No. of members in (a) for which final AFC was available	3,505	3,230	651	228	7,614
(c) No. of members in (b) that had 3 complete years of active pay history	3,195	2,986	620	222	7,023
(d) No. of members in (b) that had 6 complete years of active pay history	1,850	1,917	351	101	4,219

END OF CAREER PAYS SUMMARY OF RESULTS

Group	(A)	(B)	(C)	(D)
	Liability/Normal Cost Load	Raw Load Results Using Final 3 Years Prior to Retirement	Raw Load Results Using Reported Pays 4-6 Years Prior to Retirement	Recommended Liability/Normal Cost Load
Employees	7.5%	10.4%	25.7%	9.0%
Teachers	8.5%	3.7%	23.9%	7.0%
Police	10.6%	12.4%	30.5%	12.0%
Fire	11.2%	12.7%	32.2%	12.0%

- (A) The current assumptions used to model severance pay.
- (B) Average ratio (payroll weighted) of actual AFC at retirement and the average of the 3-year average compensation based on earnable compensation reported for annual valuations.
- (C) Average ratio (payroll weighted) of actual AFC at retirement and the average of the 3-year average compensation based on earnable compensation reported for annual valuations, 3 years prior to retirement.
- (D) Recommended assumption.

COMMENTS AND RECOMMENDATIONS

When looking at the relationship between the actual average final compensation and the final three pays reported for valuation purposes, experience over the last five years suggests that the factors should be increased for all groups except Teachers.

However, when looking at the Teachers and the Employees groups and reported pays four to six years prior to retirement, the relationships between the two groups become very similar. This suggests that the Teachers group is spreading out severance pay in the final three years of employment to a larger extent than the other groups. Since some of the end of career payments are accounted for in the valuations (for Teachers in their final 3 years) we recommend lowering the factor for Teachers.

Optional factors are adopted by the Board. Factors will be reviewed after the Board has adopted mortality and interest rate assumptions.

Marriage Assumption: Group I: 80% of males and 80% of females are assumed to be married for purposes of death-in-service benefits. Group II: 50% of males and 50% of females are assumed to be married for purposes of death-in-service and death after retirement benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes. We reviewed these assumptions based on members who retired during the study period. We recommend revising this assumption to 70% of males and 70% of females for Group I. No change is recommended for Group II.

APPENDIX

COMPREHENSIVE LISTING OF RECOMMENDED ASSUMPTIONS

EMPLOYEES PROPOSED RATES

Service Based				Normal Retirement Pattern									
Salary Scale		Select Withdrawal			Disability Rates			Age and Service			Pre-Retirement		
% Merit Increases in		Less than 6 Years of Service			% Becoming Disabled			% Retiring			Mortality		
Service Index	Rate	Service Index	Male	Female	Age	Male	Female	Age	Male	Female	Age	Male	Female
1	7.6%	1	0.3000	0.3000	20	0.02%	0.00%	60	12.0%	12.0%	20	0.02%	0.01%
2	5.3%	2	0.2200	0.2200	21	0.02%	0.00%	61	12.0%	12.0%	21	0.02%	0.01%
3	3.6%	3	0.1600	0.1600	22	0.02%	0.00%	62	17.0%	15.0%	22	0.02%	0.01%
4	2.2%	4	0.1200	0.1200	23	0.02%	0.00%	63	16.0%	15.0%	23	0.02%	0.01%
5	1.7%	5	0.0800	0.0800	24	0.02%	0.00%	64	15.0%	15.0%	24	0.02%	0.01%
6	1.6%	Sw	36	36	25	0.02%	0.01%	65	15.0%	20.0%	25	0.02%	0.01%
7	0.8%				26	0.02%	0.01%	66	25.0%	20.0%	26	0.02%	0.01%
8	0.8%				27	0.02%	0.01%	67	20.0%	20.0%	27	0.03%	0.01%
9	0.8%				28	0.02%	0.02%	68	20.0%	16.0%	28	0.03%	0.02%
10	0.8%				29	0.02%	0.02%	69	20.0%	17.0%	29	0.03%	0.02%
11	0.8%				30	0.02%	0.02%	70	100.0%	100.0%	30	0.03%	0.02%
12	0.8%				31	0.03%	0.02%	Rx	1930	1931	31	0.03%	0.02%
13	0.8%				32	0.03%	0.02%	anchor	60	60	32	0.03%	0.02%
14	0.8%				33	0.03%	0.02%				33	0.04%	0.02%
15	0.8%				34	0.03%	0.02%				34	0.04%	0.03%
16	0.8%				35	0.03%	0.02%				35	0.04%	0.03%
17	0.8%				36	0.04%	0.02%				36	0.04%	0.03%
18	0.8%				37	0.04%	0.03%				37	0.05%	0.03%
19	0.8%				38	0.05%	0.03%				38	0.06%	0.04%
20	0.8%				39	0.06%	0.04%				39	0.06%	0.04%
21	0.8%				40	0.08%	0.05%				40	0.07%	0.04%
22	0.8%				41	0.09%	0.06%				41	0.08%	0.04%
23	0.8%				42	0.10%	0.06%				42	0.08%	0.05%
24	0.8%				43	0.12%	0.07%				43	0.08%	0.05%
25	0.8%				44	0.13%	0.08%				44	0.09%	0.06%
26	0.8%				45	0.15%	0.09%				45	0.09%	0.06%
27	0.8%				46	0.17%	0.11%				46	0.09%	0.07%
28	0.8%				47	0.19%	0.12%				47	0.10%	0.07%
29	0.8%				48	0.21%	0.14%				48	0.10%	0.08%
30	0.8%				49	0.23%	0.16%				49	0.11%	0.08%
31	0.8%				50	0.25%	0.19%				50	0.11%	0.09%
32	0.8%				51	0.28%	0.22%				51	0.12%	0.10%
33	0.8%				52	0.31%	0.24%				52	0.12%	0.10%
34	0.8%				53	0.34%	0.28%				53	0.13%	0.11%
35	0.8%				54	0.38%	0.31%				54	0.14%	0.13%
36	0.8%				55	0.43%	0.35%				55	0.14%	0.15%
37	0.8%				56	0.53%	0.39%				56	0.16%	0.17%
38	0.8%				57	0.65%	0.43%				57	0.17%	0.19%
39	0.8%				58	0.78%	0.48%				58	0.19%	0.23%
40	0.8%				59	0.95%	0.52%				59	0.20%	0.27%
Ref	3				60	1.16%	0.58%				60	0.24%	0.31%
	4.50%				Hx	7	19				61	0.28%	0.35%
	0.75%				Mult	130%	75%				62	0.32%	0.40%
											63	0.37%	0.45%
											64	0.42%	0.52%
											65	0.47%	0.60%
											table	124	92
											% mult	100%	40%
											setback	10	2
											Rx	1934	1935

TEACHERS PROPOSED RATES

Service Based Salary Scale		Select Withdrawal			Disability Rates			Normal Retirement Pattern			Pre-Retirement		
% Merit Increases in		Less than 6 Years of Service			% Becoming Disabled			Age and Service			Mortality		
Service Index	Rate	Service Index	Male	Female	Age	Male	Female	Age	% Retiring		Age	Male	Female
1	6.00%	1	0.3500	0.3300	20	0.01%	0.00%	50	20.5%	17.0%	20	0.02%	0.01%
2	4.00%	2	0.1700	0.1800	21	0.01%	0.00%	51	22.0%	18.0%	21	0.02%	0.01%
3	3.00%	3	0.1400	0.1300	22	0.01%	0.00%	52	23.0%	22.0%	22	0.02%	0.01%
4	2.50%	4	0.1000	0.1100	23	0.01%	0.00%	53	24.0%	23.0%	23	0.02%	0.01%
5	2.50%	5	0.0800	0.0900	24	0.01%	0.00%	54	25.0%	24.0%	24	0.02%	0.01%
6	2.20%	Sw	184	676	25	0.01%	0.00%	55	26.0%	25.0%	25	0.02%	0.01%
7	1.70%	Ultimate Withdrawal			26	0.01%	0.00%	56	27.0%	30.0%	26	0.02%	0.01%
8	1.40%	6 or more Years of Service			27	0.01%	0.00%	57	28.0%	24.0%	27	0.03%	0.01%
9	1.20%	Age	Male	Female	28	0.01%	0.00%	58	29.0%	28.0%	28	0.03%	0.02%
10	1.20%	25	0.0350	0.0450	29	0.01%	0.00%	59	30.0%	29.0%	29	0.03%	0.02%
11	1.00%	26	0.0350	0.0450	30	0.01%	0.00%	60	100.0%	100.0%	30	0.03%	0.02%
12	1.00%	27	0.0350	0.0450	31	0.01%	0.00%	Rx	1936	1929	31	0.03%	0.02%
13	0.80%	28	0.0350	0.0450	32	0.01%	0.00%	anchor	60	60	32	0.03%	0.02%
14	0.80%	29	0.0350	0.0450	33	0.01%	0.00%	Early Retirement Pattern			33	0.04%	0.02%
15	0.80%	30	0.0350	0.0450	34	0.01%	0.00%	Age and Service			34	0.04%	0.03%
16	0.80%	31	0.0350	0.0450	35	0.01%	0.00%	Age	% Retiring		35	0.04%	0.03%
17	0.80%	32	0.0350	0.0450	36	0.01%	0.00%		Male	Female	36	0.04%	0.03%
18	0.80%	33	0.0350	0.0450	37	0.01%	0.01%	50	1.0%	0.5%	37	0.05%	0.03%
19	0.80%	34	0.0350	0.0450	38	0.01%	0.01%	51	1.0%	0.5%	38	0.06%	0.04%
20	0.80%	35	0.0350	0.0450	39	0.01%	0.01%	52	1.0%	0.5%	39	0.06%	0.04%
21	0.80%	36	0.0350	0.0450	40	0.02%	0.02%	53	1.0%	0.5%	40	0.07%	0.04%
22	0.80%	37	0.0350	0.0450	41	0.02%	0.02%	54	1.0%	1.5%	41	0.08%	0.04%
23	0.70%	38	0.0350	0.0450	42	0.02%	0.02%	55	1.0%	2.5%	42	0.08%	0.05%
24	0.70%	39	0.0350	0.0450	43	0.03%	0.02%	56	3.5%	2.5%	43	0.08%	0.05%
25	0.70%	40	0.0350	0.0450	44	0.03%	0.02%	57	2.0%	5.0%	44	0.09%	0.06%
26	0.70%	41	0.0350	0.0450	45	0.03%	0.02%	58	8.5%	6.0%	45	0.09%	0.06%
27	0.70%	42	0.0350	0.0450	46	0.04%	0.03%	59	6.0%	10.0%	46	0.09%	0.07%
28	0.70%	43	0.0350	0.0450	47	0.05%	0.03%	Rx	1925	1926	47	0.10%	0.07%
29	0.70%	44	0.0350	0.0450	48	0.05%	0.04%	anchor	50	50	48	0.10%	0.08%
30	0.70%	45	0.0350	0.0450	49	0.07%	0.04%	Rule X			49	0.11%	0.08%
31	0.70%	46	0.0350	0.0450	50	0.08%	0.05%	Age	% Retiring		50	0.11%	0.09%
32	0.50%	47	0.0350	0.0450	51	0.10%	0.05%		Male	Female	51	0.12%	0.10%
33	0.50%	48	0.0350	0.0450	52	0.12%	0.07%	45	1.5%	1.0%	52	0.12%	0.10%
34	0.50%	49	0.0350	0.0450	53	0.14%	0.09%	46	1.5%	1.0%	53	0.13%	0.11%
35	0.40%	50	0.0350	0.0450	54	0.16%	0.12%	47	1.5%	1.0%	54	0.14%	0.13%
36	0.40%	51	0.0350	0.0450	55	0.18%	0.14%	48	1.5%	1.0%	55	0.14%	0.15%
37	0.40%	52	0.0350	0.0450	56	0.20%	0.16%	49	1.5%	1.0%	56	0.16%	0.17%
38	0.30%	53	0.0350	0.0450	57	0.22%	0.16%	50	1.5%	1.0%	57	0.17%	0.19%
39	0.30%	54	0.0350	0.0450	58	0.25%	0.18%	51	1.5%	1.0%	58	0.19%	0.23%
40	0.30%	55	0.0350	0.0450	59	0.27%	0.18%	52	1.5%	1.0%	59	0.20%	0.27%
Ref	13	56	0.0350	0.0450	60	0.45%	0.00%	53	1.5%	1.0%	60	0.24%	0.31%
		57	0.0350	0.0450	Hx	2	66	54	1.5%	1.0%	61	0.28%	0.35%
		58	0.0350	0.0450	Mult	12%	30%	55	3.0%	3.0%	62	0.32%	0.40%
		59	0.0350	0.0450				56	9.0%	8.0%	63	0.37%	0.45%
		60	0.0350	0.0450				57	15.0%	13.0%	64	0.42%	0.52%
		61	0.0350	0.0450				58	16.0%	13.0%	65	0.47%	0.60%
		62	0.0350	0.0450				59	20.0%	20.0%	table	454	455
		63	0.0350	0.0450					20.0%	20.0%	% mult	45%	40%
		64	0.0350	0.0450							setback	0	0
		65	0.0350	0.0450									

POLICE PROPOSED RATES

Service Based			Normal Retirement Pattern										
Salary Scale		Select Withdrawal			Disability Rates			Age and Service			Pre-Retirement		
% Merit Increases in		Less than 6 Years of Service			% Becoming Disabled			% Retiring			Mortality		
Service Index	Rate	Service Index	Male	Female	Age	Ordinary	Duty	Age	Male	Female	Age	Male	Female
1	20.40%	1	0.3000	0.4000	20	0.04%	0.02%	45	25%	25%	20	0.02%	0.01%
2	10.40%	2	0.1500	0.1700	21	0.04%	0.02%	46	25%	25%	21	0.02%	0.01%
3	7.90%	3	0.0900	0.1400	22	0.04%	0.02%	47	25%	25%	22	0.02%	0.01%
4	5.40%	4	0.0600	0.1100	23	0.04%	0.02%	48	25%	25%	23	0.02%	0.01%
5	2.90%	5	0.0400	0.0900	24	0.04%	0.02%	49	25%	25%	24	0.02%	0.01%
6	2.90%	Sw	7	233	25	0.04%	0.02%	50	25%	25%	25	0.02%	0.01%
7	1.20%				26	0.04%	0.02%	51	25%	25%	26	0.02%	0.01%
8	0.90%				27	0.04%	0.02%	52	25%	25%	27	0.03%	0.01%
9	0.70%				28	0.04%	0.02%	53	30%	30%	28	0.03%	0.02%
10	0.70%				29	0.04%	0.02%	54	30%	30%	29	0.03%	0.02%
11	0.60%				30	0.04%	0.02%	55	30%	30%	30	0.03%	0.02%
12	0.60%				31	0.04%	0.03%	56	25%	25%	31	0.03%	0.02%
13	0.50%				32	0.05%	0.03%	57	25%	25%	32	0.03%	0.02%
14	0.50%				33	0.06%	0.04%	58	30%	30%	33	0.04%	0.02%
15	0.50%				34	0.07%	0.05%	59	25%	25%	34	0.04%	0.03%
16	0.50%				35	0.08%	0.05%	60	25.0%	25.0%	35	0.04%	0.03%
17	0.50%				36	0.10%	0.07%	61	20.0%	20.0%	36	0.04%	0.03%
18	0.50%				37	0.11%	0.07%	62	20.0%	20.0%	37	0.05%	0.03%
19	0.50%				38	0.13%	0.09%	63	25.0%	25.0%	38	0.06%	0.04%
20	0.50%				39	0.15%	0.10%	64	25.0%	25.0%	39	0.06%	0.04%
21	0.40%				40	0.18%	0.12%	65	25.0%	25.0%	40	0.07%	0.04%
22	0.40%				41	0.20%	0.13%	66	100.0%	100.0%	41	0.08%	0.04%
23	0.40%				42	0.22%	0.15%	Rx	1938	1938	42	0.08%	0.05%
24	0.40%				43	0.25%	0.17%	anchor	45	45	43	0.08%	0.05%
25	0.40%				44	0.28%	0.19%				44	0.09%	0.06%
26	0.40%				45	0.32%	0.21%				45	0.09%	0.06%
27	0.40%				46	0.35%	0.23%				46	0.09%	0.07%
28	0.40%				47	0.38%	0.26%				47	0.10%	0.07%
29	0.40%				48	0.42%	0.28%				48	0.10%	0.08%
30	0.40%				49	0.46%	0.31%				49	0.11%	0.08%
31	0.40%				50	0.50%	0.34%				50	0.11%	0.09%
32	0.40%				51	0.55%	0.37%				51	0.12%	0.10%
33	0.40%				52	0.59%	0.40%				52	0.12%	0.10%
34	0.40%				53	0.64%	0.43%				53	0.13%	0.11%
35	0.40%				54	0.70%	0.46%				54	0.14%	0.13%
36	0.40%				55	0.75%	0.50%				55	0.14%	0.15%
37	0.40%				56	0.81%	0.54%				56	0.16%	0.17%
38	0.40%				57	0.86%	0.58%				57	0.17%	0.19%
39	0.40%				58	0.93%	0.62%				58	0.19%	0.23%
40	0.40%				59	0.99%	0.66%				59	0.20%	0.27%
Ref	15				60	0.00%	0.00%				60	0.24%	0.31%
					Hx	35	35				61	0.28%	0.35%
					Mult	45.0%	30.0%				62	0.32%	0.40%
					Wx	61	61				63	0.37%	0.45%
					WxMult	200.0%	200.0%				64	0.42%	0.52%
											65	0.47%	0.60%
											table	454	455
											% mult	75%	75%
											setback	0	0

FIRE PROPOSED RATES

Service Based			Normal Retirement Pattern										
Salary Scale		Select Withdrawal			Disability Rates			Age and Service			Pre-Retirement		
% Merit Increases in		Less than 6 Years of Service			Age	% Becoming Disabled		Age	% Retiring		Mortality		
Service Index	Rate	Service Index	Male	Female		Ordinary	Duty		Male	Female	Age	Male	Female
1	20.8%	1	0.0800	0.0800	20	0.04%	0.02%	45	15%	15%	20	0.02%	0.01%
2	10.8%	2	0.0600	0.0600	21	0.04%	0.02%	46	12%	12%	21	0.02%	0.01%
3	8.3%	3	0.0450	0.0450	22	0.04%	0.02%	47	12%	12%	22	0.02%	0.01%
4	5.8%	4	0.0300	0.0300	23	0.04%	0.02%	48	12%	12%	23	0.02%	0.01%
5	3.3%	5	0.0200	0.0200	24	0.04%	0.02%	49	12%	12%	24	0.02%	0.01%
6	3.3%	Sw	13	13	25	0.04%	0.02%	50	15%	15%	25	0.02%	0.01%
7	1.6%	Ultimate Withdrawal			26	0.05%	0.02%	51	15%	15%	26	0.02%	0.01%
8	1.3%				27	0.05%	0.02%	27	0.05%	0.02%	52	15%	15%
9	1.1%	6 or more Years of Service			28	0.05%	0.02%	53	25%	25%	28	0.03%	0.02%
10	1.1%				Age	Male	Female	29	0.05%	0.02%	54	20%	20%
11	1.0%	25	0.0150	0.0150	30	0.05%	0.02%	55	30%	30%	30	0.03%	0.02%
12	1.0%	26	0.0150	0.0150	31	0.06%	0.03%	56	30%	30%	31	0.03%	0.02%
13	0.9%	27	0.0150	0.0150	32	0.06%	0.03%	57	25%	25%	32	0.03%	0.02%
14	0.9%	28	0.0150	0.0150	33	0.06%	0.03%	58	25%	25%	33	0.04%	0.02%
15	0.9%	29	0.0150	0.0150	34	0.06%	0.03%	59	25%	25%	34	0.04%	0.03%
16	0.9%	30	0.0150	0.0150	35	0.06%	0.03%	60	25%	25%	35	0.04%	0.03%
17	0.9%	31	0.0150	0.0150	36	0.06%	0.04%	61	40%	40%	36	0.04%	0.03%
18	0.9%	32	0.0150	0.0150	37	0.07%	0.04%	62	30%	30%	37	0.05%	0.03%
19	0.9%	33	0.0150	0.0150	38	0.08%	0.05%	63	30%	30%	38	0.06%	0.04%
20	0.9%	34	0.0150	0.0150	39	0.10%	0.06%	64	30%	30%	39	0.06%	0.04%
21	0.8%	35	0.0150	0.0150	40	0.11%	0.08%	65	100%	100%	40	0.07%	0.04%
22	0.8%	36	0.0150	0.0150	41	0.14%	0.09%	Rx	1937	1937	41	0.08%	0.04%
23	0.8%	37	0.0150	0.0150	42	0.16%	0.10%	anchor	45	45	42	0.08%	0.05%
24	0.8%	38	0.0150	0.0150	43	0.18%	0.12%				43	0.08%	0.05%
25	0.8%	39	0.0150	0.0150	44	0.21%	0.13%				44	0.09%	0.06%
26	0.8%	40	0.0150	0.0150	45	0.23%	0.15%				45	0.09%	0.06%
27	0.8%	41	0.0150	0.0150	46	0.26%	0.17%				46	0.09%	0.07%
28	0.8%	42	0.0150	0.0150	47	0.30%	0.19%				47	0.10%	0.07%
29	0.8%	43	0.0150	0.0150	48	0.36%	0.21%				48	0.10%	0.08%
30	0.8%	44	0.0150	0.0150	49	0.44%	0.23%				49	0.11%	0.08%
31	0.8%	45	0.0150	0.0150	50	0.54%	0.25%				50	0.11%	0.09%
32	0.8%	46	0.0150	0.0150	51	0.66%	0.28%				51	0.12%	0.10%
33	0.8%	47	0.0150	0.0150	52	0.79%	0.31%				52	0.12%	0.10%
34	0.8%	48	0.0150	0.0150	53	0.93%	0.34%				53	0.13%	0.11%
35	0.8%	49	0.0150	0.0150	54	1.06%	0.38%				54	0.14%	0.13%
36	0.8%	50	0.0150	0.0150	55	1.21%	0.43%				55	0.14%	0.15%
37	0.8%	51	0.0150	0.0150	56	1.35%	0.53%				56	0.16%	0.17%
38	0.8%	52	0.0150	0.0150	57	1.50%	0.65%				57	0.17%	0.19%
39	0.8%	53	0.0150	0.0150	58	1.65%	0.78%				58	0.19%	0.23%
40	0.8%	54	0.0150	0.0150	59	1.80%	0.95%				59	0.20%	0.27%
Ref	15	54	0.0150	0.0150	60	3.00%	1.16%				60	0.24%	0.31%
		Wx	151	151	Hx	2	7				61	0.28%	0.35%
		Wx Mult	150.0%	150.0%	Mult	80%	130%				62	0.32%	0.40%
											63	0.37%	0.45%
											64	0.42%	0.52%
											65	0.47%	0.60%
											table	454	455
											% mult	50%	50%
											setback	0	0

HEALTHY MORTALITY PROPOSED RATES

Age	% Dying Next Year		Age	% Dying Next Year	
	Male	Female		Male	Female
50	0.1487%	0.1189%	81	6.0125%	4.4124%
51	0.1669%	0.1341%	82	6.8542%	4.8916%
52	0.1781%	0.1522%	83	7.6403%	5.4313%
53	0.1947%	0.1734%	84	8.6701%	6.0405%
54	0.2134%	0.1983%	85	9.6240%	6.8664%
55	0.2469%	0.2314%	86	10.6702%	7.8137%
56	0.2921%	0.2740%	87	12.0616%	8.8916%
57	0.3331%	0.3146%	88	13.6225%	9.9037%
58	0.3819%	0.3549%	89	15.0545%	11.2205%
59	0.4306%	0.4017%	90	16.9280%	12.4002%
60	0.4887%	0.4573%	91	18.4380%	13.6171%
61	0.5674%	0.5259%	92	20.3973%	14.8426%
62	0.6473%	0.6022%	93	22.0035%	16.3744%
63	0.7552%	0.6918%	94	23.6072%	17.5624%
64	0.8508%	0.7797%	95	25.6992%	18.6875%
65	0.9607%	0.8780%	96	27.2762%	19.7318%
66	1.1091%	0.9909%	97	28.8083%	21.0976%
67	1.2374%	1.1003%	98	30.9050%	21.9510%
68	1.3480%	1.2162%	99	32.3665%	22.6803%
69	1.4936%	1.3443%	100	33.7730%	23.2763%
70	1.6413%	1.5145%	101	35.8628%	24.4834%
71	1.8161%	1.6472%	102	37.1685%	25.4498%
72	2.0164%	1.8322%	103	38.3040%	26.6044%
73	2.2460%	1.9959%	104	39.2003%	27.9055%
74	2.5057%	2.2121%	105	39.7886%	29.3116%
75	2.8538%	2.3935%	106	40.0000%	30.7811%
76	3.1808%	2.6371%	107	40.0000%	32.2725%
77	3.6105%	2.9635%	108	40.0000%	33.7441%
78	4.0942%	3.2667%	109	40.0000%	35.1544%
79	4.6431%	3.6066%	110	100.0000%	100.0000%
80	5.2647%	3.9866%	Ref	#454sb0x1	#455sb0x1

**GROUP I
DISABLED MORTALITY
PROPOSED RATES**

Age	% Dying Next Year		Age	% Dying Next Year	
	Male	Female		Male	Female
50	3.0640%	3.0640%	81	9.7680%	9.7680%
51	3.2080%	3.2080%	82	10.5760%	10.5760%
52	3.3600%	3.3600%	83	11.4560%	11.4560%
53	3.5120%	3.5120%	84	12.4080%	12.4080%
54	3.6800%	3.6800%	85	13.4480%	13.4480%
55	3.8560%	3.8560%	86	14.6000%	14.6000%
56	4.0480%	4.0480%	87	15.8400%	15.8400%
57	4.2480%	4.2480%	88	17.2000%	17.2000%
58	4.4400%	4.4400%	89	18.6400%	18.6400%
59	4.6480%	4.6480%	90	20.2000%	20.2000%
60	4.8240%	4.8240%	91	21.9120%	21.9120%
61	4.9920%	4.9920%	92	23.7760%	23.7760%
62	5.1440%	5.1440%	93	25.8080%	25.8080%
63	5.2560%	5.2560%	94	27.9600%	27.9600%
64	5.3440%	5.3440%	95	30.3120%	30.3120%
65	5.4240%	5.4240%	96	32.8720%	32.8720%
66	5.4960%	5.4960%	97	35.6640%	35.6640%
67	5.5760%	5.5760%	98	38.7040%	38.7040%
68	5.6720%	5.6720%	99	41.9440%	41.9440%
69	5.7840%	5.7840%	100	45.4720%	45.4720%
70	5.9120%	5.9120%	101	49.3120%	49.3120%
71	6.0560%	6.0560%	102	53.4960%	53.4960%
72	6.2080%	6.2080%	103	58.0560%	58.0560%
73	6.3680%	6.3680%	104	62.9200%	62.9200%
74	6.5440%	6.5440%	105	68.2160%	68.2160%
75	6.7360%	6.7360%	106	73.9760%	73.9760%
76	6.9520%	6.9520%	107	80.0000%	80.0000%
77	7.2640%	7.2640%	108	80.0000%	80.0000%
78	7.6960%	7.6960%	109	80.0000%	80.0000%
79	8.3440%	8.3440%	110	100.0000%	100.0000%
80	9.0240%	9.0240%	Ref	#250sb0x0.8	#250sb0x0.8

GROUP II
DISABLED MORTALITY
PROPOSED RATES

Age	% Dying Next Year		Age	% Dying Next Year	
	Male	Female		Male	Female
50	3.0640%	3.0640%	81	9.7680%	9.7680%
51	3.2080%	3.2080%	82	10.5760%	10.5760%
52	3.3600%	3.3600%	83	11.4560%	11.4560%
53	3.5120%	3.5120%	84	12.4080%	12.4080%
54	3.6800%	3.6800%	85	13.4480%	13.4480%
55	3.8560%	3.8560%	86	14.6000%	14.6000%
56	4.0480%	4.0480%	87	15.8400%	15.8400%
57	4.2480%	4.2480%	88	17.2000%	17.2000%
58	4.4400%	4.4400%	89	18.6400%	18.6400%
59	4.6480%	4.6480%	90	20.2000%	20.2000%
60	4.8240%	4.8240%	91	21.9120%	21.9120%
61	4.9920%	4.9920%	92	23.7760%	23.7760%
62	5.1440%	5.1440%	93	25.8080%	25.8080%
63	5.2560%	5.2560%	94	27.9600%	27.9600%
64	5.3440%	5.3440%	95	30.3120%	30.3120%
65	5.4240%	5.4240%	96	32.8720%	32.8720%
66	5.4960%	5.4960%	97	35.6640%	35.6640%
67	5.5760%	5.5760%	98	38.7040%	38.7040%
68	5.6720%	5.6720%	99	41.9440%	41.9440%
69	5.7840%	5.7840%	100	45.4720%	45.4720%
70	5.9120%	5.9120%	101	49.3120%	49.3120%
71	6.0560%	6.0560%	102	53.4960%	53.4960%
72	6.2080%	6.2080%	103	58.0560%	58.0560%
73	6.3680%	6.3680%	104	62.9200%	62.9200%
74	6.5440%	6.5440%	105	68.2160%	68.2160%
75	6.7360%	6.7360%	106	73.9760%	73.9760%
76	6.9520%	6.9520%	107	80.0000%	80.0000%
77	7.2640%	7.2640%	108	80.0000%	80.0000%
78	7.6960%	7.6960%	109	80.0000%	80.0000%
79	8.3440%	8.3440%	110	100.0000%	100.0000%
80	9.0240%	9.0240%	Ref	#250sb0x0.8	#250sb0x0.8

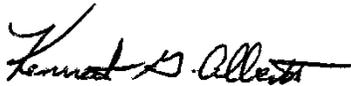
March 1, 2011

Ms. Kim France
Interim Executive Director
New Hampshire Retirement System
54 Regional Drive
Concord, New Hampshire 03301

Dear Kim:

Enclosed please find 30 copies of the report of the July 1, 2005 - June 30, 2010
experience study for the New Hampshire Retirement System.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth G. Alberts". The signature is written in a cursive style with a horizontal line extending to the right.

Kenneth G. Alberts

KGA:sac
Enclosures