

**Missouri Department of Transportation
and Highway Patrol Employees'
Retirement System**
Five-Year Experience Study
July 1, 1999 - June 30, 2004

Gabriel, Roeder, Smith & Company



Actuaries & Consultants

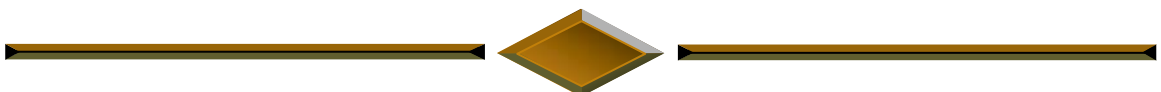


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March 29, 2005

The Retirement Board
Missouri Department of Transportation
and Highway Patrol Employees' Retirement System
Jefferson City, Missouri

Ladies and Gentlemen:

Presented in this report are the results of an *actuarial investigation of experience* of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System (MPERS). The investigation was conducted for the purpose of updating the actuarial assumptions used in valuing MPERS actuarial liabilities and establishing employer contribution rates.

The investigation was based upon the member data furnished for annual actuarial valuations during the period *July 1, 1999 to June 30, 2004*.

The report presents specific recommendations with respect to non-economic assumptions and presents a range of potential choices for the economic assumptions. Non-economic activities (rates of turnover, retirement, etc.) tend to be generally stable and are subject to measurement by the actuary. Economic activities (inflation, investment return) tend to be unstable and are not really subject to direct measurement. We believe that the Board should select the economic assumptions from within ranges that the Board and the actuary deem reasonable.

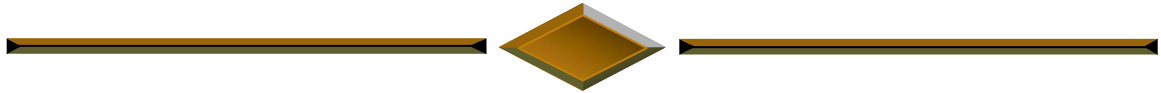
The investigation was carried out using generally accepted actuarial principles and techniques in accordance with standards of practice prescribed by the Actuarial Standards Board. We believe that the recommended actuarial assumptions that are the result of this investigation form a reasonable basis for computing future contributions and measuring funding progress for the Missouri Department of Transportation and Highway Patrol Employees' Retirement System.

Respectfully submitted,

Brian B. Murphy, F.S.A., E.A.

Kenneth G. Alberts

SUMMARY OF FINDINGS



1999 - 2004 EXPERIENCE STUDY

INTRODUCTION

Each year, as of June 30, the liabilities of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System are valued. In order to perform the valuation, assumptions must be made regarding the future experience of the system with regard to the following risk areas:

- Rates of **withdrawal** of active participants.
- Rates of **disability** among active participants.
- Patterns of **salary increases** to active participants.
- Rates of **retirement** among active participants.
- Rates of **mortality** among active participants, retirees, and beneficiaries.
- Long-term rates of **investment return** to be generated by the assets of the Fund.

Assumptions should be carefully chosen and continually monitored. A poor initial choice of assumptions or continued use of outdated assumptions can lead to:

- Understated costs resulting in either an inability to pay benefits when due, or sharp increases in required contributions at some point in the future;
- Overstated costs resulting in either benefit levels that are kept below the level that could be supported by the computed rate or an unnecessarily large burden on the current generation of participants, employers and taxpayers.

A single set of assumptions will not be suitable indefinitely. Conditions change, and our understanding of conditions (whether or not they are changing) also changes.

In recognition of this, Missouri statutes require that assumptions used to value the liabilities of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System be studied in-depth every five years. The package of assumptions is then adjusted to reflect basic experience trends -- but not random year-to-year fluctuations. Actuarial assumptions were last revised following the June 30, 1999 regular actuarial valuation.

1999 - 2004 EXPERIENCE STUDY

SUMMARY OF DECREMENT EXPERIENCE

Background: In general, recent patterns of non-economic activity (rates of withdrawal, disability, death, retirement, and merit and seniority pay increases) tend to be reliable predictors of future experience. However, past activity will also contain anomalies (or special circumstances) that cannot be assumed to replicate in the future. The actuary attempts to identify and remove these anomalies before creating recommended rates. The goal is to identify long-term trends in activity and move the rates toward those trends as a result of the periodic investigations. In establishing our recommendations, we have considered the results of the prior study, as well as the observed trends from this study.

Experience was studied separately for Uniformed members and Non-Uniformed members. For the Non-Uniformed members, the experience was further broken down between male and female members. Male and female experience was studied in aggregate for the Uniformed group since it is over 95% male.

Rates of Withdrawals: Withdrawals from service were studied separately for members with less than five years of service and members with five or more years of service. Actual rates of separation from employment for all member groups in both categories were above assumed rates. The recommended rates represent approximately a 50% increase in assumed rates for Uniformed members and a 10% to 15% increase in assumed rates for Non-Uniformed members.

Disability: Observed rates of disability are lower than assumed in all groups except Non-Uniformed males. The recommended rates reduce the assumption to more closely track experience. The recommendation for Non-Uniformed males is a continuation of the current assumption.

Normal Retirement: In 2002, a back DROP provision was added to this plan. It was estimated that the provision would have the effect of delaying retirement. This estimate was achieved by modifying the probabilities of retirement based on years since first eligible to retire with unreduced benefits. We studied retirement experience for the two valuation years that the provision was in effect and found no significant variation from the patterns of retirement emanating from the full five-year period. We believe that the long-term effects of the back DROP provision have yet to materialize in retirement experience.

1999 - 2004 EXPERIENCE STUDY

SUMMARY OF DECREMENT EXPERIENCE (CONCLUDED)

Normal Retirement (continued): Therefore, we developed initial rates based on an analysis of experience and then reduced most of those rates prior to age 62 to account for the anticipated effects of the back DROP provision. The result is a pattern of rates based strictly on age. Overall, however, rates were increased from the current assumption, particularly at the later ages.

Early Retirement: Experience indicated slightly less early retirements than assumed at most ages and significantly more at age 62 for males and ages 62 and higher for females. The recommended rates were adjusted accordingly.

Mortality: Mortality rates for both active and retired MPERS members suggest that the current mortality table remains reasonable. While the study shows that expected deaths slightly exceeded actual deaths for retired members (original annuitants), the valuation results over the study period have indicated a small mortality gain. This gain likely resulted from survivor experience (which was excluded from the study). In addition, the most recent experience study for MOSERS indicates that the current table continues to be reasonable for their members and includes a margin for mortality improvement. It is not expected that MPERS members would experience mortality at a slower rate than MOSERS members and the MOSERS population is a much larger group. Mortality experience of larger groups is more credible than the experience of smaller groups. We therefore recommend no change in the mortality rate assumptions.

Pay Increase Rate (Merit and Longevity Portion) was analyzed to see if the correlation with service was stronger than the correlation with age. For MPERS members during the study period, however, the correlation was stronger by age than by service. Therefore, we recommend continuing to associate assumed pay increases with age. Rates were adjusted for experience. Overall, these adjustments were small. The largest adjustments were made at the youngest ages.

Complete listings of all assumptions begin on page 34.

SUMMARY OF DECREMENT EXPERIENCE 1999-2004

| Decrement Risk Area | Actual | Expected | |
|---|--------|----------|----------|
| | | Current | Proposed |
| <u>Withdrawal - Total</u> | | | |
| Uniform | 144 | 75 | 112 |
| Non-Uniform | | | |
| Male | 1,817 | 1,239 | 1,450 |
| Female | 624 | 461 | 510 |
| <u>Withdrawal - Service 5 & Up</u> | | | |
| Uniform | 96 | 45 | 66 |
| Non-Uniform | | | |
| Male | 420 | 291 | 327 |
| Female | 248 | 203 | 221 |
| <u>Disability</u> | | | |
| Uniform | 2 | 6 | 3 |
| Non-Uniform | | | |
| Male | 48 | 64 | 64 |
| Female | 17 | 27 | 24 |
| <u>Early Retirement</u> | | | |
| Non-Uniform | | | |
| Male | 27 | 71 | 43 |
| Female | 22 | 21 | 22 |
| <u>Normal Retirement</u> | | | |
| Uniform | 130 | 112 | 110 |
| Non-Uniform | | | |
| Male | 1,225 | 647 | 822 |
| Female | 125 | 104 | 110 |
| <u>Mortality - Retired Lives</u> | | | |
| Healthy Lives | | | |
| Male | 645 | 671 | 671 |
| Female | 19 | 25 | 25 |
| <u>Mortality - Active Lives</u> | | | |
| Male | 43 | 47 | 47 |
| Female | - | 7 | 7 |

DATA RECONCILIATION 1999-2004

Uniformed Members

| Year | Active Members Beginning of Year | Retired | Disabled | Died | Vested Terminated | Non-Vested Terminated | New | Active Members End of Year |
|--------|-------------------------------------|---------|----------|------|----------------------|--------------------------|-----|-------------------------------|
| 1999 | 1,086 | 27 | | | 11 | 12 | 43 | 1,079 |
| 2000 | 1,079 | 20 | | 1 | 27 | 8 | 54 | 1,077 |
| 2001 | 1,077 | 32 | 1 | 1 | 18 | 13 | 23 | 1,035 |
| 2002 | 1,035 | 27 | | 1 | 16 | 3 | 85 | 1,073 |
| 2003 | 1,073 | 24 | 1 | | 19 | 17 | 29 | 1,041 |
| 2004 | 1,041 | | | | | | | |
| 5-year | 1,086 | 130 | 2 | 3 | 91 | 53 | 234 | 1,041 |

Non-Uniformed Members

| Year | Active Members Beginning of Year | Retired | Disabled | Died | Vested Terminated | Non-Vested Terminated | New | Active Members End of Year |
|--------|-------------------------------------|---------|----------|------|----------------------|--------------------------|-------|-------------------------------|
| 1999 | 8,054 | 292 | 10 | 10 | 133 | 415 | 898 | 8,092 |
| 2000 | 8,092 | 407 | 8 | 5 | 136 | 465 | 939 | 8,010 |
| 2001 | 8,010 | 235 | 17 | 13 | 121 | 422 | 458 | 7,660 |
| 2002 | 7,660 | 207 | 23 | 7 | 104 | 259 | 759 | 7,819 |
| 2003 | 7,819 | 258 | 7 | 5 | 82 | 304 | 798 | 7,961 |
| 2004 | 7,961 | | | | | | | |
| 5-year | 8,054 | 1,399 | 65 | 40 | 576 | 1,865 | 3,852 | 7,961 |

ECONOMIC ASSUMPTIONS

Economic assumptions include **long-term rates of investment return** (net after expenses) and **wage inflation** (the across-the-board portion of salary increases). Unlike demographic activities, economic activities do not lend themselves to analysis solely on the basis of internal historical patterns because returns are more affected by external forces; namely inflation and general productivity changes which defy accurate long-term prediction. Estimates of economic activities are generally selected on the basis of the expectations in an inflation-free environment and then both are increased by some provision for long-term inflation.

If inflation and/or productivity increases are higher than expected, it will probably result in both actual rates of salary increases and investment return which exceed the assumed rates. Salaries increasing faster than expected produce unexpected liabilities. Investment return exceeding the assumed rates (whether due to manager performance, change in the mix of assets, or general market conditions) results in unanticipated assets. To the extent that inflation, productivity, and other factors have about the same effect on both sides of the balance sheet, these additional assets and liabilities can offset one another over the long-term.

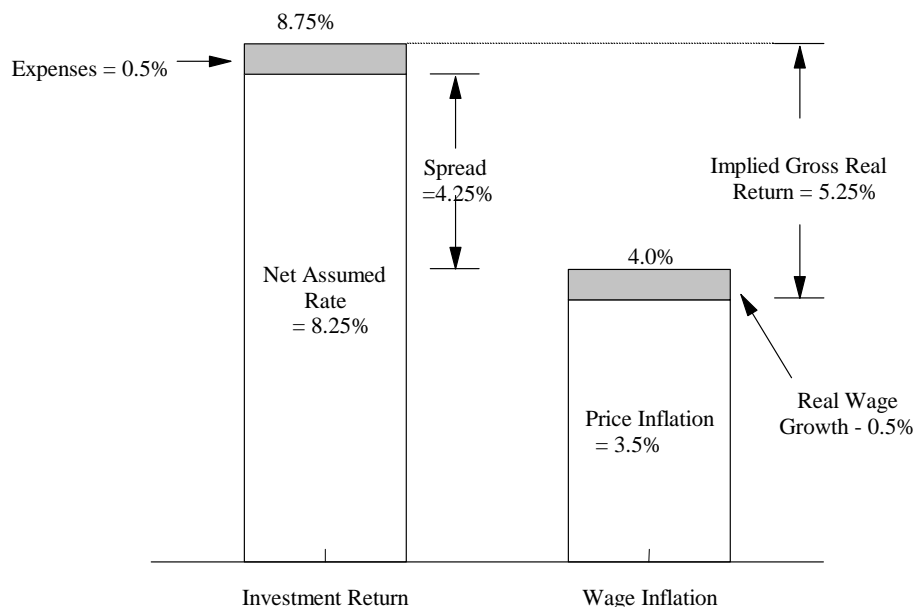
The present experience period includes investment results that are most unusual by long-term standards. While information from the present experience period may be considered in developing new assumptions, long-term historical patterns must necessarily play a much larger role.

Wage inflation. The average rate of increase in National Average Earnings over the last 55 years is higher than the current MPERS 4.0% assumption (see schedule on page 9). However, both regional and national average salaries have risen at a slower pace than 4.0% per year since 1999 (the MPERS average has been 2.2% annually and the national average has been 2.8%). The 10-year average increase is 4.0%, nationally and 2.9% for MPERS. We believe it is reasonable to assume that the average rate in the future will be between the MPERS experience and the national average experience of the last ten years. Therefore, we are demonstrating results based upon the current 4.00% wage inflation assumption and a 3.75% wage inflation assumption.

Investment Return. We believe that 8.25% continues to be reasonable. Staff has also indicated their comfort with this assumption. In reviewing historical rates of return, based on a sample portfolio with a similar asset allocation to MPERS, we see the 5, 10 and 55 year returns to be 3.7%, 11.3% and 9.8%, respectively. Whether the future will be more like the more distant past than the recent past cannot be known now. However, even prior to the 2000-2002 investment market disappointments, 8% was the most common interest rate assumption for governmental plans similar to MPERS. Therefore we are reviewing results based on both an 8.25% rate of return assumption and an 8.00% rate of return assumption.

Resulting Spread. The combination of 8.25% assumed return and 4.0% assumed rate of payroll growth results in an assumed “spread” of 4.25% ($8.25\% - 4.0\% = 4.25\%$). Spreads for balanced portfolios have actually averaged 4.4% over the last 55 years (please see page 9), even including the poor investment experience in the early 2000s and periods of very high price and wage inflation in the late 1970s. We believe that an assumed spread of 4.0% to 4.5% is reasonable for MPERS.

The relationship between economic assumptions based on a 4.25% spread is illustrated below:



HISTORICAL PATTERNS OF INVESTMENT RETURN, PAY INCREASES & INFLATION

| Calendar Year Period | Gross Market Returns | | | Stocks (S&P 500) | Price Inflation (CPI) | National Average Earnings | Sample Balanced Fund | |
|----------------------|----------------------|----------------|-----------------------|------------------|-----------------------|---------------------------|----------------------|---------------------|
| | Bonds (Long) | | Cash Equiv. (T Bills) | | | | Total Return (I) | Spread: I - NAE - e |
| | U.S. Treasury | Corp. (S&P AA) | | | | | | |
| 1950-59 | (0.1)% | 1.0 % | 1.9 % | 19.4 % | 2.2 % | 4.5 % | 11.3 % | 6.3 % |
| 1960-69 | 1.4 % | 1.7 % | 3.9 % | 7.8 % | 2.5 % | 4.3 % | 5.4 % | 0.6 % |
| 1970-79 | 5.5 % | 6.2 % | 6.3 % | 5.9 % | 7.4 % | 6.9 % | 6.2 % | (1.2)% |
| 1980-89 | 12.6 % | 13.0 % | 8.9 % | 17.5 % | 5.1 % | 5.8 % | 15.5 % | 9.2 % |
| 1990-99 | 8.8 % | 8.4 % | 4.9 % | 18.2 % | 2.9 % | 4.2 % | 13.9 % | 9.2 % |
| 2000 | 21.5 % | 12.9 % | 5.9 % | (9.1)% | 3.4 % | 5.5 % | 2.2 % | (3.8)% |
| 2001 | 3.7 % | 10.7 % | 3.8 % | (11.9)% | 1.6 % | 2.4 % | (3.5)% | (6.4)% |
| 2002 | 17.8 % | 16.3 % | 1.7 % | (22.1)% | 2.4 % | 1.0 % | (5.2)% | (6.7)% |
| 2003 | 1.5 % | 5.3 % | 1.0 % | 28.7 % | 1.9 % | 2.4 % | 17.2 % | 14.3 % |
| 2004 | 8.5 % | 8.7 % | 1.2 % | 10.9 % | 3.9 % | 2.9 % | 9.5 % | 6.1 % |
| Last 5 Years | 10.3 % | 10.7 % | 2.7 % | (2.3)% | 2.6 % | 2.8 % | 3.7 % | 0.4 % |
| Last 10 Years | 9.8 % | 9.5 % | 3.9 % | 12.1 % | 2.5 % | 4.0 % | 11.3 % | 6.8 % |
| Last 55 Years | 6.0 % | 6.4 % | 4.9 % | 12.1 % | 3.9 % | 4.9 % | 9.8 % | 4.4 % |

| Sample Balanced Fund | |
|----------------------|-----------|
| Equities | 55% |
| Bonds - Government | 20% |
| - Corporate | 20% |
| Cash Equivalents | <u>5%</u> |
| | 100% |
| Fund expenses(e) | 0.50% |

| Historical Spread | |
|--|--------|
| Observed spread is very sensitive to the observation period, even over long periods, as illustrated below: | |
| Observation Period | Spread |
| 55 years | 4.4% |
| 45 years | 3.6% |
| 35 years | 4.6% |

TABLE 4
SEVERANCE EXPERIENCE

| COMPLETED SERVICE IN YEARS | NON-UNIFORMED MALES | | | FEMALES | | | UNIFORMED PATROL | | |
|-------------------------------|---------------------|------------------------|----------------------|------------------|------------------------|----------------------|------------------|------------------------|----------------------|
| | Years Exposed | Expected Severances | Actual Severances | Years Exposed | Expected Severances | Actual Severances | Years Exposed | Expected Severances | Actual Severances |
| 0 | 3,333.1 | 1,133.25 | 947 | 505.8 | 156.80 | 144 | 175.1 | 7.00 | 6 |
| 1 | 2,588.5 | 501.52 | 373 | 364.8 | 113.09 | 101 | 184.3 | 7.37 | 7 |
| 2 | 2,343.6 | 313.46 | 278 | 268.3 | 57.42 | 41 | 230.2 | 9.21 | 11 |
| 3 | 2,177.7 | 204.16 | 233 | 220.4 | 47.17 | 36 | 257.3 | 6.05 | 15 |
| 4 | 2,030.9 | 139.62 | 164 | 186.3 | 39.87 | 27 | 283.6 | 11.34 | 8 |
| 5 | 1,796.5 | 96.56 | 104 | 154.3 | 33.02 | 25 | 299.3 | 11.97 | 9 |
| 6 | 1,618.0 | 70.79 | 69 | 115.5 | 21.02 | 12 | 260.6 | 9.12 | 7 |
| 7 | 1,461.7 | 52.99 | 55 | 84.3 | 12.65 | 3 | 201.8 | 6.05 | 0 |
| 8 | 1,365.9 | 40.98 | 43 | 72.8 | 6.26 | 6 | 163.5 | 4.09 | 6 |
| 9 | 1,263.5 | 31.59 | 31 | 58.0 | 3.13 | 4 | 126.4 | 2.53 | 3 |
| 10 | 1,223.4 | 26.00 | 24 | 43.8 | 1.66 | 4 | 92.2 | 1.57 | 1 |
| 11 | 1,140.5 | 21.38 | 28 | 35.4 | 1.06 | 1 | 91.7 | 1.38 | 3 |
| 12 | 1,116.1 | 18.14 | 16 | 32.2 | .84 | 1 | 132.3 | 1.72 | 0 |
| 13 | 1,207.7 | 18.12 | 16 | 27.7 | .66 | 0 | 116.6 | 1.40 | 1 |
| 14 | 1,258.2 | 17.30 | 15 | 19.5 | .43 | 1 | 101.6 | 1.12 | 1 |
| 15 | 1,144.2 | 14.30 | 14 | 20.6 | .41 | 1 | 111.6 | 1.12 | 2 |
| 16 | 1,138.5 | 14.23 | 26 | 16.6 | .33 | 0 | 105.3 | 1.05 | 0 |
| 17 | 1,029.6 | 12.87 | 7 | 19.8 | .40 | 1 | 71.0 | .71 | 1 |
| 18 | 896.1 | 11.20 | 12 | 16.8 | .34 | 1 | 81.6 | .82 | 0 |
| 19 | 749.1 | 9.36 | 9 | 15.4 | .31 | 0 | 80.3 | .80 | 0 |
| 20-24 | 2,801.9 | 35.02 | 17 | 61.4 | 1.23 | 4 | 317.3 | 3.17 | 1 |
| 25-29 | 1,230.2 | 15.38 | 7 | 38.7 | .77 | 1 | 201.4 | 2.01 | 1 |
| 30 & Over | 422.4 | 5.28 | 0 | 36.1 | .72 | 0 | 36.8 | .37 | 0 |
| ALL | 35,337.3 | 2,803.50 | 2,488 | 2,414.5 | 499.59 | 414 | 3,721.8 | 96.21 | 83 |

SUMMARY OF VALUATION RESULTS

The table below describes hypothetical valuation results at June 30, 2004 with new and old decrement assumptions with indicated spreads. The rate changes are illustrative only since contribution rates have already been set based upon the actual June 30, 2004 valuation results.

| Non-Uniformed Group | Present Assumptions | Proposed Decrement Assumptions, Asset Changes and Indicated Economic Assumptions | | |
|---|---------------------|--|----------------|----------------|
| | | Present | Alt. 1 | Alt. 2 |
| Assumptions | | | | |
| Investment Return | 8.25 % | 8.25 % | 8.25 % | 8.00 % |
| Wage Inflation | 4.00 % | 4.00 % | 3.75 % | 3.75 % |
| Investment Spread | 4.25 % | 4.25 % | 4.50 % | 4.25 % |
| Price Inflation | 3.50 % | 3.50 % | 3.25 % | 3.25 % |
| Contributions for | | | | |
| Normal Cost | 11.79 % | 11.80 % | 11.22 % | 11.91 % |
| Unfunded Actuarial Accrued Liability | 17.64 % | 17.96 % | 18.02 % | 18.58 % |
| Disability Insurance | 0.56 % | 0.56 % | 0.56 % | 0.56 % |
| Administrative Expenses | 0.50 % | 0.50 % | 0.50 % | 0.50 % |
| Total Computed Employer Contribution | 30.49 % | 30.82 % | 30.30 % | 31.55 % |

| Uniformed Group | Present Assumptions | Proposed Decrement Assumptions, Asset Changes and Indicated Economic Assumptions | | |
|---|---------------------|--|----------------|----------------|
| | | Present | Alt. 1 | Alt. 2 |
| Assumptions | | | | |
| Investment Return | 8.25 % | 8.25 % | 8.25 % | 8.00 % |
| Wage Inflation | 4.00 % | 4.00 % | 3.75 % | 3.75 % |
| Investment Spread | 4.25 % | 4.25 % | 4.50 % | 4.25 % |
| Price Inflation | 3.50 % | 3.50 % | 3.25 % | 3.25 % |
| Contributions for | | | | |
| Normal Cost | 13.55 % | 13.88 % | 13.18 % | 14.01 % |
| Unfunded Actuarial Accrued Liability | 29.66 % | 29.76 % | 29.73 % | 30.97 % |
| Disability Insurance | 0.56 % | 0.56 % | 0.56 % | 0.56 % |
| Administrative Expenses | 0.50 % | 0.50 % | 0.50 % | 0.50 % |
| Total Computed Employer Contribution | 44.27 % | 44.70 % | 43.97 % | 46.04 % |

| MPERS | Present Assumptions | Proposed Decrement Assumptions, Asset Changes and Indicated Economic Assumptions | | |
|----------------------|---------------------|--|---------------|---------------|
| | | Present | Alt. 1 | Alt. 2 |
| Assumptions | | | | |
| Investment Return | 8.25 % | 8.25 % | 8.25 % | 8.00 % |
| Wage Inflation | 4.00 % | 4.00 % | 3.75 % | 3.75 % |
| Investment Spread | 4.25 % | 4.25 % | 4.50 % | 4.25 % |
| Price Inflation | 3.50 % | 3.50 % | 3.25 % | 3.25 % |
| Funded Status | 53.4 % | 53.4 % | 54.2 % | 52.7 % |

New assumptions will be first used in the June 30, 2005 actuarial valuations, at which time experience gains or losses incurred during 2004/2005 will also be recognized. Consequently, no rate changes are recommended at this time.

OTHER RECOMMENDATIONS

Load for unused sick leave: Currently Normal and Early retirement benefits are increased by 4.3% for Uniformed members and 2.6% for Non-Uniformed members to account for the inclusion of unused sick leave in the calculation of Average Pay. A review of the unused sick leave for active members currently eligible for retirement indicates the following:

| Member Group | Number | Average Service | Average Unused Sick Leave* | Ratio |
|-----------------|--------|-----------------|----------------------------|-------|
| Uniformed | 100 | 31.2 yrs | 1.32 yrs | 4.23% |
| MoDOT | 631 | 27.4 yrs | 0.74 yrs | 2.70% |
| Civilian Patrol | 139 | 26.3 yrs | 0.72 yrs | 2.74% |

** Based on crediting 1 month of service for every 168 hours of unused sick leave.*

This review supports continued use of the current loads. We recommend that these loads be continued, unchanged.

Funding Value of Assets: As of June 30, 2004 the funding value of assets was 98.4% of the market value of assets. The difference was \$21.3 million. Yet there are \$26.2 million of past losses and \$47.4 million of past gains scheduled to be recognized in the next two years. Investment return over the past few years has been particularly volatile. Given the proximity of the actuarial value of assets and the market value of assets to each other, we recommend setting the actuarial value equal to the market value and re-starting the smoothing process. This will result in an increase in the funding value of assets of \$21.3 million as of July 1, 2004. We also recommend continuation of the current smoothing process, which would begin again with the investment return for the year ending June 30, 2005, with the addition of a 20% corridor. This corridor would limit the funding value of assets to the range of 80% of market value to 120% of market value.

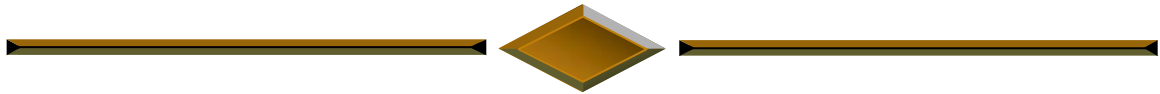
Optional forms of payment: Reduction factors for MSEP 2000 are codified in the statute and are probably slightly subsidized (compared to factors based on the recommended valuation interest and mortality assumptions). We recommend the addition of a load to account for this subsidy. Factors for MSEP are adopted by the Board. We reviewed these factors and find them to be actuarially equivalent within reasonable tolerances. The load for MSEP 2000 was determined by looking at the members who retired during the last five years and determining the following information:

- Average age at retirement and option elected;
- Average beneficiary age at retirement;
- Percent of members electing each type of option;
- Percent of males electing each type of option.

Based on this information, the actuarial equivalent option factor was developed for each Joint & Survivor option and compared with the statutory factor. This resulted in a recommended load of 1.5% for Uniformed members and 1.0% for Non-Uniformed members.

MSEP 2000 Load: The normal cost for the normal retirement decrement for Non-Uniformed members is loaded to account for anticipated changes in the pattern of retirements due to the year 2000 Plan. We believe that the changes are now evident in the experience and the newly recommended pattern. We therefore recommend discontinuation of this load.

WITHDRAWAL EXPERIENCE



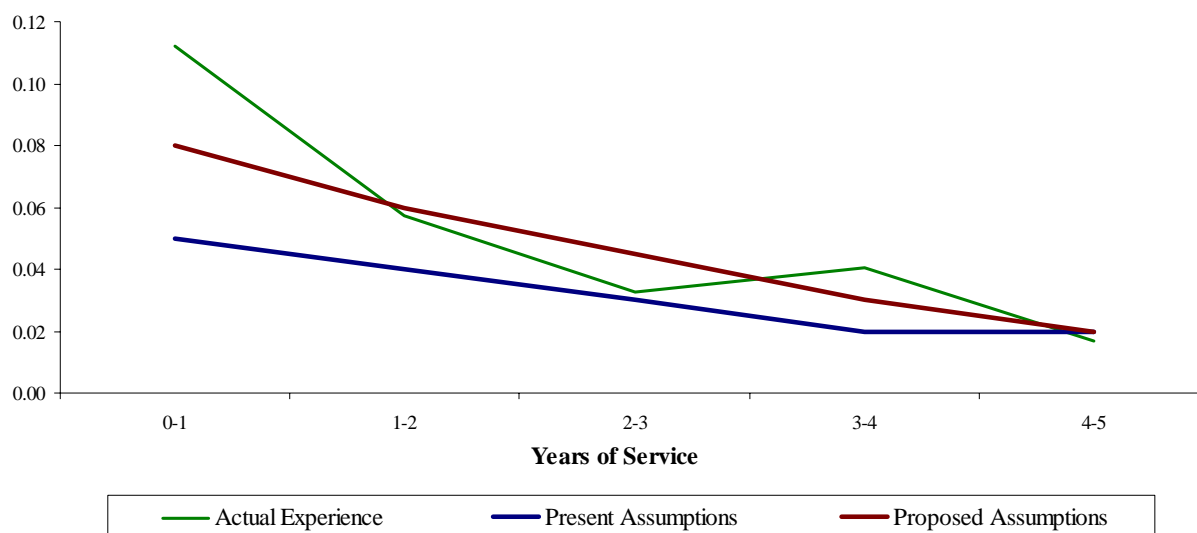
UNIFORMED MEMBERS SERVICE-BASED WITHDRAWAL EXPERIENCE

There were 48 withdrawals and 1,009 years of exposure included in the service-based withdrawal investigation. Withdrawals are separations from active member status for a reason other than disability, death, or retirement.

WITHDRAWALS WITH LESS THAN 5 YEARS OF SERVICE

| Years of Service | Life Years Exposure | Number of Withdrawals | | | Withdrawal Rates | | |
|------------------|---------------------|-----------------------|-----------|-----------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 0-1 | 134 | 15 | 7 | 11 | 0.1119 | 0.0500 | 0.0800 |
| 1-2 | 209 | 12 | 8 | 13 | 0.0574 | 0.0400 | 0.0600 |
| 2-3 | 214 | 7 | 6 | 10 | 0.0327 | 0.0300 | 0.0450 |
| 3-4 | 273 | 11 | 5 | 8 | 0.0403 | 0.0200 | 0.0300 |
| 4-5 | 179 | 3 | 4 | 4 | 0.0168 | 0.0200 | 0.0200 |
| Totals | 1,009 | 48 | 30 | 46 | 0.0476 | 0.0297 | 0.0456 |

RATES OF WITHDRAWALS WITH LESS THAN 5 YEARS OF SERVICE



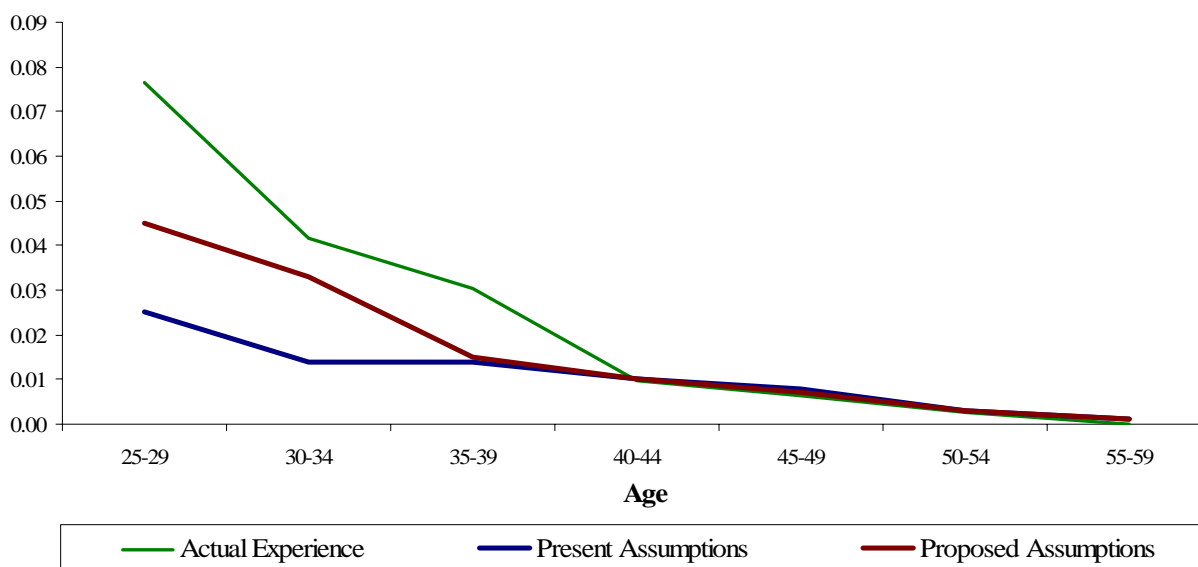
UNIFORMED MEMBERS AGE-BASED WITHDRAWAL EXPERIENCE

There were 96 withdrawals and 3,927 years of exposure included in the age-based withdrawal investigation. Withdrawals are separations from active member status for a reason other than disability, death, or retirement.

WITHDRAWALS WITH 5 OR MORE YEARS OF SERVICE

| Age | Life Years Exposure | Number of Withdrawals | | | Withdrawal Rates | | |
|---------------|---------------------|-----------------------|-----------|-----------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 25-29 | 144 | 11 | 4 | 6 | 0.0764 | 0.0250 | 0.0450 |
| 30-34 | 1,012 | 42 | 14 | 33 | 0.0415 | 0.0140 | 0.0330 |
| 35-39 | 1,019 | 31 | 14 | 15 | 0.0304 | 0.0140 | 0.0150 |
| 40-44 | 710 | 7 | 7 | 7 | 0.0099 | 0.0100 | 0.0100 |
| 45-49 | 639 | 4 | 5 | 4 | 0.0063 | 0.0080 | 0.0070 |
| 50-54 | 393 | 1 | 1 | 1 | 0.0025 | 0.0030 | 0.0030 |
| 55-59 | 10 | 0 | 0 | 0 | 0.0000 | 0.0010 | 0.0010 |
| Totals | 3,927 | 96 | 45 | 66 | 0.0244 | 0.0115 | 0.0168 |

RATES OF WITHDRAWALS WITH 5 OR MORE YEARS OF SERVICE



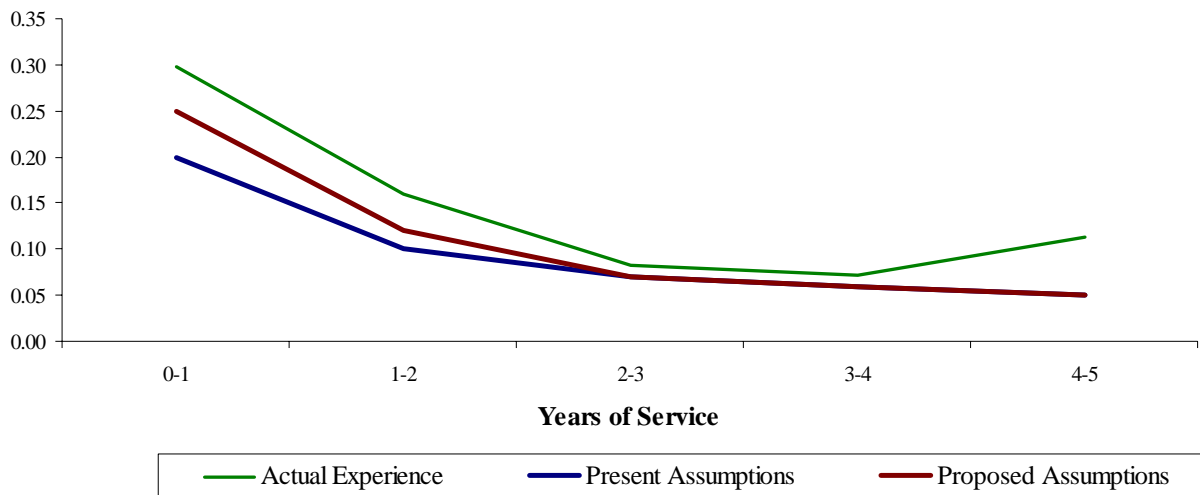
NON-UNIFORMED MALES SERVICE-BASED WITHDRAWAL EXPERIENCE

There were 1,397 withdrawals and 8,048 years of exposure included in the male service-based withdrawal investigation. Withdrawals are separations from active member status for a reason other than disability, death, or retirement.

WITHDRAWALS WITH LESS THAN 5 YEARS OF SERVICE

| Years of Service | Life Years Exposure | Number of Withdrawals | | | Withdrawal Rates | | |
|------------------|---------------------|-----------------------|------------|--------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 0-1 | 2,691 | 800 | 538 | 673 | 0.2973 | 0.2000 | 0.2500 |
| 1-2 | 1,990 | 318 | 199 | 239 | 0.1598 | 0.1000 | 0.1200 |
| 2-3 | 1,379 | 113 | 97 | 97 | 0.0819 | 0.0700 | 0.0700 |
| 3-4 | 1,428 | 103 | 86 | 86 | 0.0721 | 0.0600 | 0.0600 |
| 4-5 | 560 | 63 | 28 | 28 | 0.1125 | 0.0500 | 0.0500 |
| Totals | 8,048 | 1,397 | 948 | 1,123 | 0.1736 | 0.1178 | 0.1395 |

RATES OF WITHDRAWALS WITH LESS THAN 5 YEARS OF SERVICE



NON-UNIFORMED MALES AGE-BASED WITHDRAWAL EXPERIENCE

There were 420 withdrawals and 17,604 years of exposure included in the male age-based withdrawal investigation. Withdrawals are separations from active member status for a reason other than disability, death, or retirement.

WITHDRAWALS WITH 5 OR MORE YEARS OF SERVICE

| Age | Life Years Exposure | Number of Withdrawals | | | Withdrawal Rates | | |
|---------------|---------------------|-----------------------|------------|------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 20-24 | 36 | 2 | 1 | 1 | 0.0556 | 0.0400 | 0.0470 |
| 25-29 | 772 | 41 | 30 | 36 | 0.0531 | 0.0390 | 0.0470 |
| 30-34 | 2,122 | 87 | 64 | 72 | 0.0410 | 0.0300 | 0.0340 |
| 35-39 | 3,055 | 96 | 67 | 76 | 0.0314 | 0.0220 | 0.0250 |
| 40-44 | 4,318 | 82 | 65 | 69 | 0.0190 | 0.0150 | 0.0160 |
| 45-49 | 4,357 | 54 | 48 | 48 | 0.0124 | 0.0110 | 0.0110 |
| 50-54 | 2,630 | 39 | 16 | 24 | 0.0148 | 0.0060 | 0.0090 |
| 55-59 | 228 | 14 | 0 | 1 | 0.0614 | 0.0020 | 0.0050 |
| 60 & Up | 86 | 5 | 0 | 0 | 0.0581 | 0.0000 | 0.0001 |
| Totals | 17,604 | 420 | 291 | 327 | 0.0239 | 0.0165 | 0.0186 |

RATES OF WITHDRAWALS WITH 5 OR MORE YEARS OF SERVICE

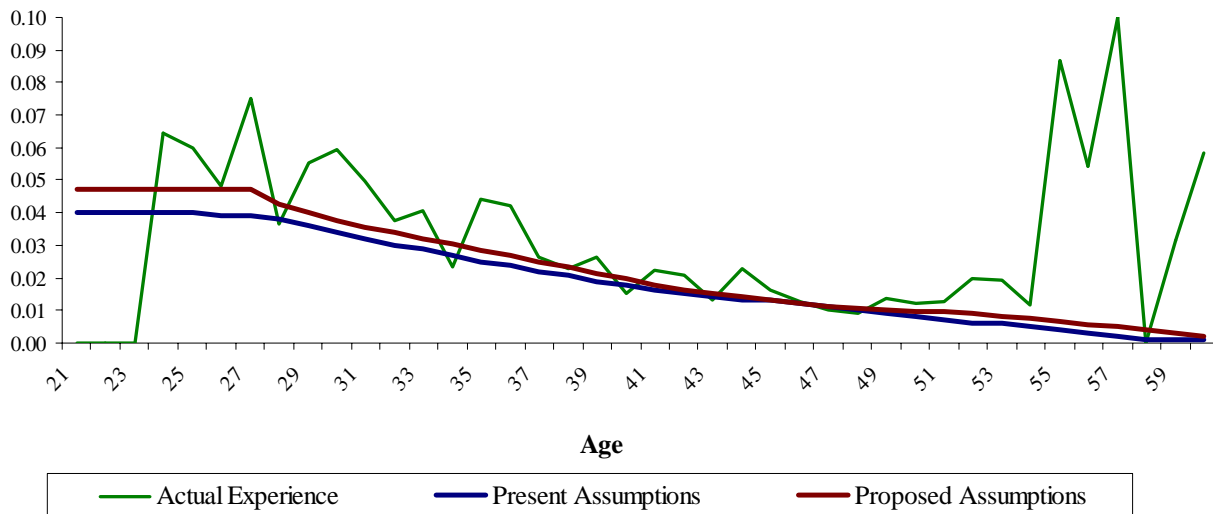


TABLE 5
PENSIONER MORTALITY

| AGES | NON-UNIFORMED MALES | | | FEMALES | | | UNIFORMED PATROL | | | AGES |
|-----------|--------------------------|--------------------|------------------|--------------------------|--------------------|------------------|--------------------------|--------------------|------------------|-----------|
| | Years Exposed To Risk | Expected Deaths | Actual Deaths | Years Exposed To Risk | Expected Deaths | Actual Deaths | Years Exposed To Risk | Expected Deaths | Actual Deaths | |
| - 51 | 92.1 | 5.41 | 10 | 0.0 | 0.00 | 0 | 5.0 | 0.48 | 0 | - 51 |
| 52 - 54 | 52.6 | 3.59 | 3 | 0.5 | 0.02 | 0 | 0.0 | 0.00 | 0 | 52 - 54 |
| 55 - 57 | 93.6 | 5.94 | 4 | 3.0 | 0.14 | 1 | 17.2 | 1.64 | 1 | 55 - 57 |
| 58 - 60 | 131.8 | 9.16 | 9 | 2.8 | 0.13 | 0 | 82.8 | 3.09 | 1 | 58 - 60 |
| 61 - 63 | 429.9 | 33.51 | 18 | 8.3 | 0.39 | 0 | 135.7 | 2.46 | 2 | 61 - 63 |
| 64 - 66 | 893.6 | 25.44 | 25 | 16.0 | 0.30 | 0 | 93.0 | 2.13 | 2 | 64 - 66 |
| 67 - 69 | 1,065.0 | 37.51 | 28 | 47.9 | 0.81 | 0 | 49.2 | 1.43 | 1 | 67 - 69 |
| 70 - 72 | 972.5 | 41.88 | 51 | 52.0 | 1.21 | 0 | 15.6 | 0.59 | 1 | 70 - 72 |
| 73 - 75 | 625.0 | 32.46 | 30 | 57.3 | 1.86 | 0 | 8.3 | 0.41 | 2 | 73 - 75 |
| 76 - 78 | 417.5 | 26.98 | 35 | 36.5 | 1.60 | 0 | .3 | .02 | 0 | 76 - 78 |
| 79 - 81 | 267.1 | 25.78 | 21 | 9.1 | 0.53 | 1 | 0.0 | 0.00 | 0 | 79 - 81 |
| 82 - 84 | 156.0 | 19.30 | 23 | 1.3 | 0.10 | 0 | 0.0 | 0.00 | 0 | 82 - 84 |
| 85 - 87 | 50.2 | 8.06 | 6 | 2.9 | 0.34 | 0 | 0.0 | 0.00 | 0 | 85 - 87 |
| 88 - 90 | 19.8 | 4.19 | 1 | 2.1 | 0.32 | 0 | 0.0 | 0.00 | 0 | 88 - 90 |
| 91 & Over | 14.2 | 3.84 | 3 | 0.0 | 0.00 | 0 | 0.0 | 0.00 | 0 | 91 & Over |
| ALL | 5,280.9 | 283.05 | 267 | 239.7 | 7.75 | 2 | 407.1 | 12.25 | 10 | |

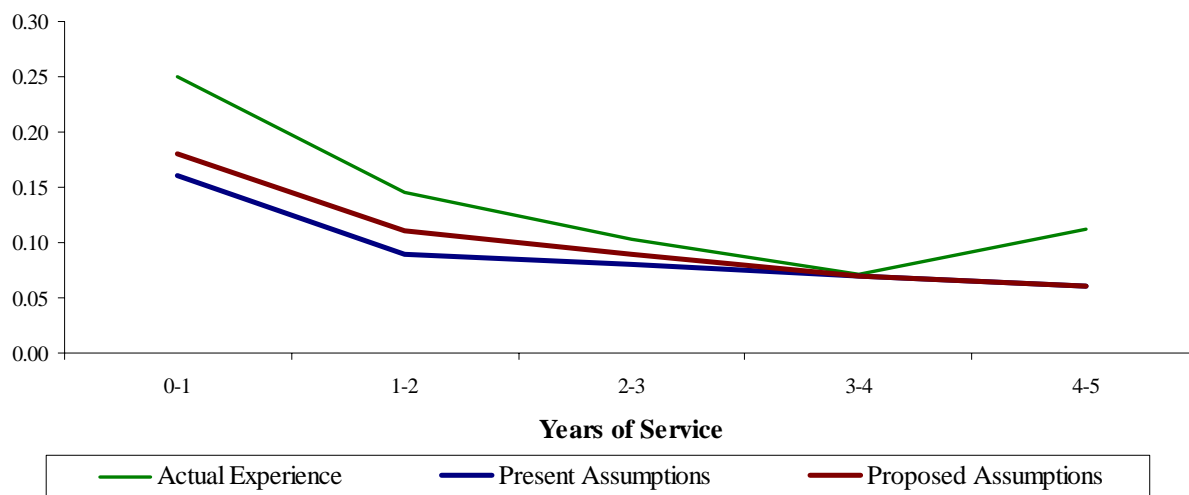
NON-UNIFORMED FEMALES SERVICE-BASED WITHDRAWAL EXPERIENCE

There were 376 withdrawals and 2,675 years of exposure included in the female service-based withdrawal investigation. Withdrawals are separations from active member status for a reason other than disability, death, or retirement.

WITHDRAWALS WITH LESS THAN 5 YEARS OF SERVICE

| Years of Service | Life Years Exposure | Number of Withdrawals | | | Withdrawal Rates | | |
|------------------|---------------------|-----------------------|------------|------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 0-1 | 596 | 149 | 95 | 107 | 0.2500 | 0.1600 | 0.1800 |
| 1-2 | 689 | 100 | 62 | 76 | 0.1451 | 0.0900 | 0.1100 |
| 2-3 | 560 | 58 | 45 | 50 | 0.1036 | 0.0800 | 0.0900 |
| 3-4 | 581 | 41 | 41 | 41 | 0.0706 | 0.0700 | 0.0700 |
| 4-5 | 249 | 28 | 15 | 15 | 0.1124 | 0.0600 | 0.0600 |
| Totals | 2,675 | 376 | 258 | 289 | 0.1406 | 0.0964 | 0.1080 |

RATES OF WITHDRAWALS WITH LESS THAN 5 YEARS OF SERVICE



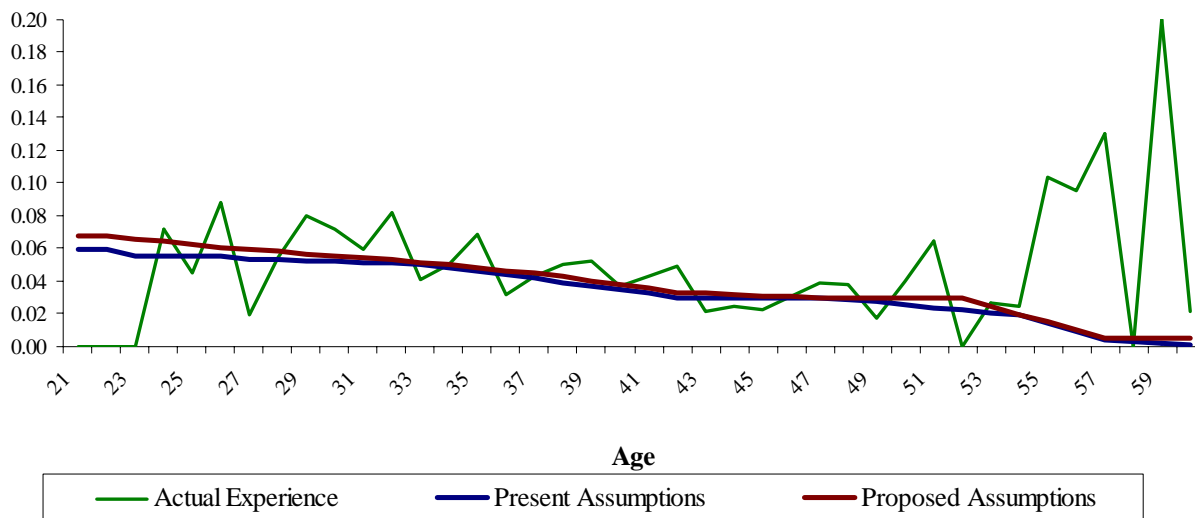
NON-UNIFORMED FEMALES AGE-BASED WITHDRAWAL EXPERIENCE

There were 248 withdrawals and 5,860 years of exposure included in the female age-based withdrawal investigation. Withdrawals are separations from active member status for a reason other than disability, death, or retirement.

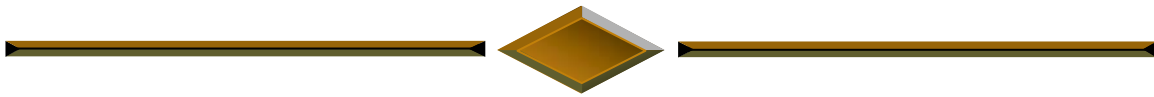
WITHDRAWALS WITH 5 OR MORE YEARS OF SERVICE

| Age | Life Years Exposure | Number of Withdrawals | | | Withdrawal Rates | | |
|---------------|---------------------|-----------------------|------------|------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 20-24 | 20 | 1 | 1 | 1 | 0.0500 | 0.0600 | 0.0674 |
| 25-29 | 311 | 19 | 16 | 18 | 0.0611 | 0.0530 | 0.0593 |
| 30-34 | 789 | 47 | 40 | 42 | 0.0596 | 0.0510 | 0.0530 |
| 35-39 | 1,157 | 57 | 49 | 52 | 0.0493 | 0.0420 | 0.0450 |
| 40-44 | 1,392 | 49 | 42 | 46 | 0.0352 | 0.0300 | 0.0330 |
| 45-49 | 1,248 | 37 | 37 | 37 | 0.0296 | 0.0300 | 0.0300 |
| 50-54 | 788 | 26 | 18 | 24 | 0.0330 | 0.0230 | 0.0300 |
| 55-59 | 108 | 11 | 0 | 1 | 0.1019 | 0.0040 | 0.0050 |
| 60 & Up | 47 | 1 | 0 | 0 | 0.0213 | 0.0000 | 0.0050 |
| Totals | 5,860 | 248 | 203 | 221 | 0.0423 | 0.0346 | 0.0377 |

RATES OF WITHDRAWALS WITH 5 OR MORE YEARS OF SERVICE



DISABILITY EXPERIENCE



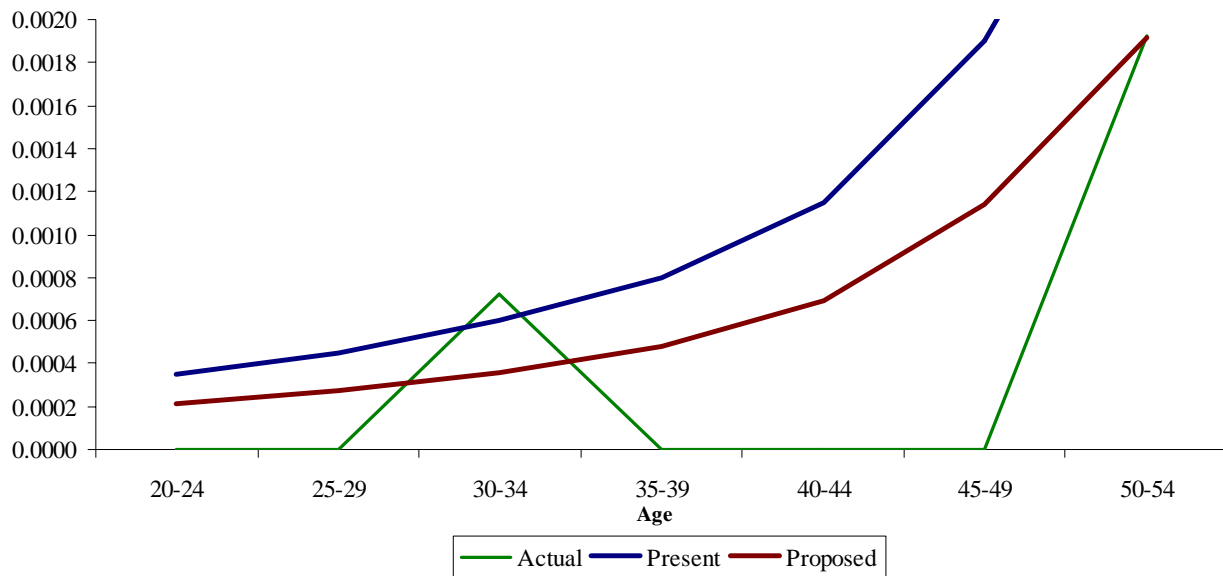
UNIFORMED MEMBERS DISABILITY EXPERIENCE

There were 2 disability benefit claims reported for the 5-year period and 5,177 years of exposure.

DISABLED UNIFORMED MEMBERS

| Age | Life Years Exposure | Number of Disabilities | | | Disability Rates | | |
|---------------|---------------------|------------------------|----------|----------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 20-24 | 124 | 0 | 0 | 0 | 0.0000 | 0.0003 | 0.0002 |
| 25-29 | 790 | 0 | 0 | 0 | 0.0000 | 0.0004 | 0.0003 |
| 30-34 | 1,389 | 1 | 1 | 1 | 0.0007 | 0.0006 | 0.0004 |
| 35-39 | 1,019 | 0 | 1 | 0 | 0.0000 | 0.0008 | 0.0005 |
| 40-44 | 694 | 0 | 1 | 0 | 0.0000 | 0.0012 | 0.0007 |
| 45-49 | 642 | 0 | 1 | 1 | 0.0000 | 0.0019 | 0.0011 |
| 50-54 | 519 | 1 | 2 | 1 | 0.0019 | 0.0032 | 0.0019 |
| Totals | 5,177 | 2 | 6 | 3 | 0.0004 | 0.0012 | 0.0006 |

RATES OF DISABLED UNIFORMED MEMBERS



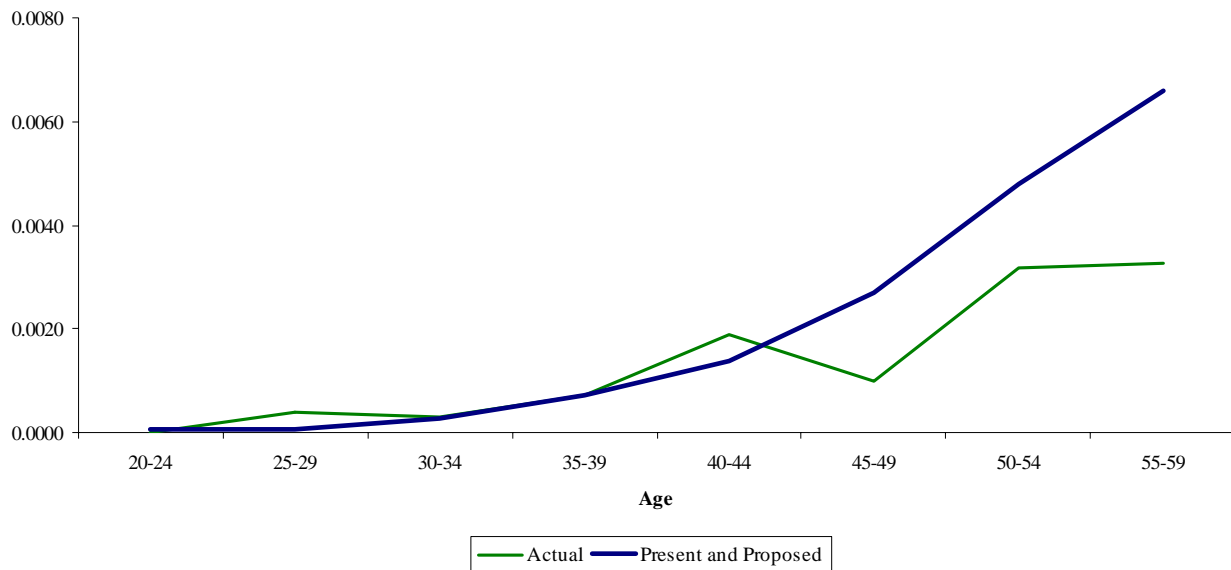
NON-UNIFORMED MALES DISABILITY EXPERIENCE

There were 48 disability benefit claims reported for the 5-year period and 30,287 years of exposure.

DISABLED NON-UNIFORMED MALES

| Age | Life Years Exposure | Number of Disabilities | | | Disability Rates | | |
|---------------|------------------------|------------------------|-----------|-----------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 20-24 | 1,134 | 0 | 0 | 0 | 0.0000 | 0.0001 | 0.0001 |
| 25-29 | 2,554 | 1 | 0 | 0 | 0.0004 | 0.0001 | 0.0001 |
| 30-34 | 3,429 | 1 | 1 | 1 | 0.0003 | 0.0003 | 0.0003 |
| 35-39 | 4,248 | 3 | 3 | 3 | 0.0007 | 0.0007 | 0.0007 |
| 40-44 | 5,333 | 10 | 7 | 7 | 0.0019 | 0.0014 | 0.0014 |
| 45-49 | 5,054 | 5 | 14 | 14 | 0.0010 | 0.0027 | 0.0027 |
| 50-54 | 4,409 | 14 | 21 | 21 | 0.0032 | 0.0048 | 0.0048 |
| 55-59 | 2,758 | 9 | 18 | 18 | 0.0033 | 0.0066 | 0.0066 |
| 60-64 | 1,219 | 5 | 0 | 0 | 0.0041 | 0.0000 | 0.0000 |
| 65-69 | 147 | 0 | 0 | 0 | 0.0000 | 0.0000 | 0.0000 |
| 70 & Up | 2 | 0 | 0 | 0 | 0.0000 | 0.0000 | 0.0000 |
| Totals | 30,287 | 48 | 64 | 64 | 0.0016 | 0.0021 | 0.0021 |

RATES OF DISABLED NON-UNIFORMED MALES



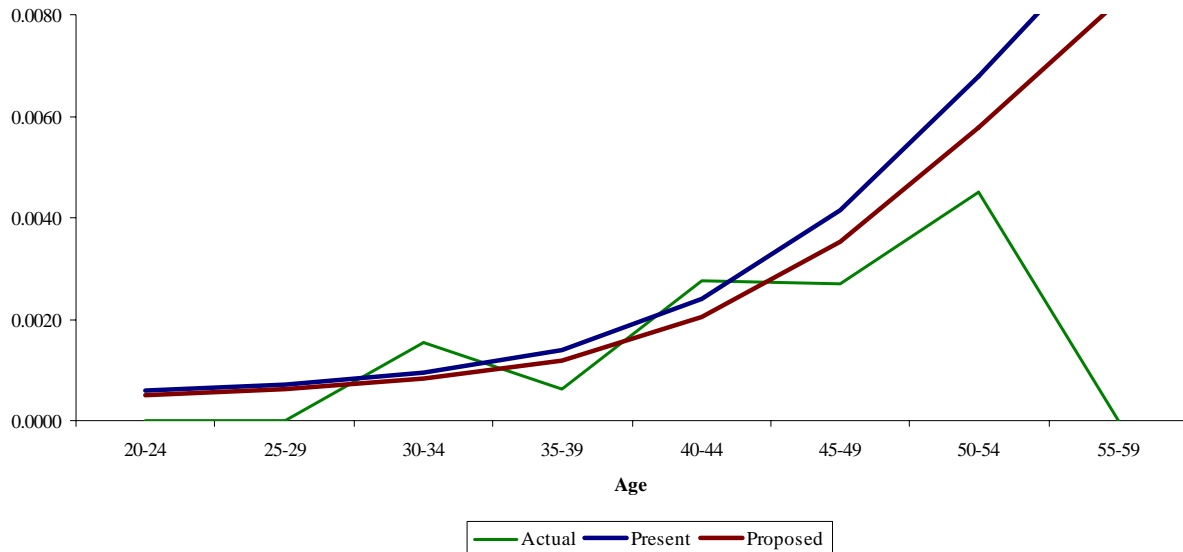
NON-UNIFORMED FEMALES DISABILITY EXPERIENCE

There were 17 disability benefit claims reported for the 5-year period and 9,281 years of exposure.

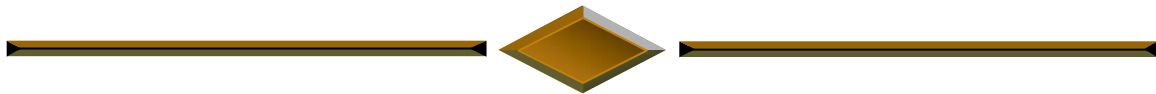
DISABLED NON-UNIFORMED FEMALES

| Age | Life Years Exposure | Number of Disabilities | | | Disability Rates | | |
|---------------|------------------------|------------------------|-----------|-----------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 20-24 | 289 | 0 | 0 | 0 | 0.0000 | 0.0006 | 0.0005 |
| 25-29 | 838 | 0 | 1 | 1 | 0.0000 | 0.0007 | 0.0006 |
| 30-34 | 1,294 | 2 | 1 | 1 | 0.0015 | 0.0010 | 0.0008 |
| 35-39 | 1,617 | 1 | 2 | 2 | 0.0006 | 0.0014 | 0.0012 |
| 40-44 | 1,817 | 5 | 4 | 4 | 0.0028 | 0.0024 | 0.0020 |
| 45-49 | 1,481 | 4 | 6 | 5 | 0.0027 | 0.0041 | 0.0035 |
| 50-54 | 1,107 | 5 | 8 | 6 | 0.0045 | 0.0068 | 0.0058 |
| 55-59 | 555 | 0 | 5 | 5 | 0.0000 | 0.0097 | 0.0083 |
| 60-64 | 232 | 0 | 0 | 0 | 0.0000 | 0.0000 | 0.0000 |
| 65-69 | 50 | 0 | 0 | 0 | 0.0000 | 0.0000 | 0.0000 |
| 70& Up | 1 | 0 | 0 | 0 | 0.0000 | 0.0000 | 0.0000 |
| Totals | 9,281 | 17 | 27 | 24 | 0.0018 | 0.0029 | 0.0026 |

RATES OF DISABLED NON-UNIFORMED FEMALES



NORMAL & EARLY RETIREMENT EXPERIENCE



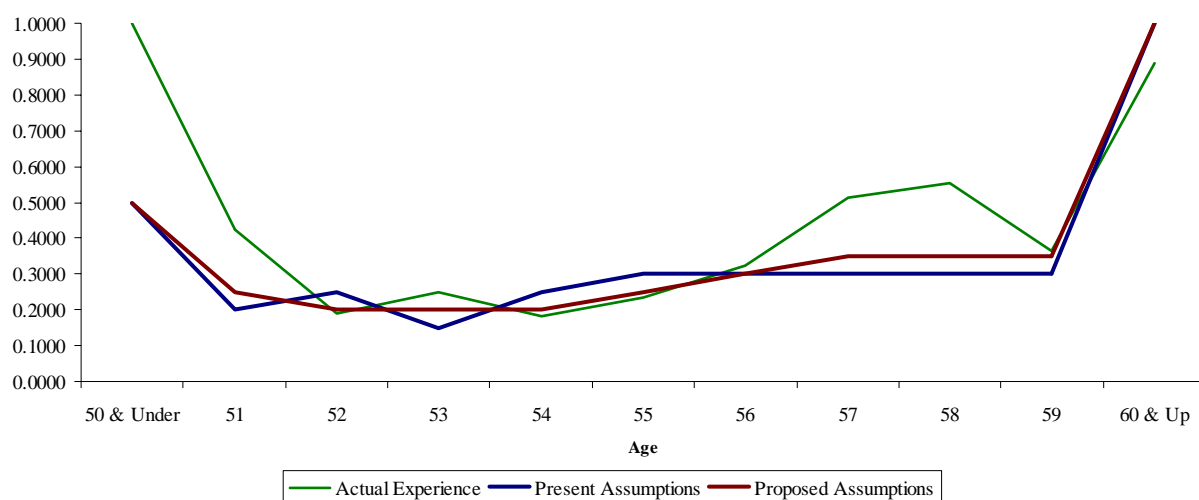
UNIFORMED MEMBERS NORMAL RETIREMENT EXPERIENCE

There were 130 age and service unreduced retirements and 414 life years of exposure (exposure includes active members eligible for unreduced retirement) in the retirement investigation.

SUMMARY OF UNIFORMED AGE & SERVICE UNREDUCED RETIREMENT EXPERIENCE

| Age | Life Years Exposure | Number of Retirements | | | Retirement Rates | | |
|--------------|---------------------|-----------------------|------------|------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 50 & Under | 5 | 5 | 3 | 3 | 1.0000 | 0.5000 | 0.5000 |
| 51 | 40 | 17 | 8 | 10 | 0.4250 | 0.2000 | 0.2500 |
| 52 | 58 | 11 | 15 | 12 | 0.1897 | 0.2500 | 0.2000 |
| 53 | 72 | 18 | 11 | 14 | 0.2500 | 0.1500 | 0.2000 |
| 54 | 66 | 12 | 17 | 13 | 0.1818 | 0.2500 | 0.2000 |
| 55 | 60 | 14 | 18 | 15 | 0.2333 | 0.3000 | 0.2500 |
| 56 | 40 | 13 | 12 | 12 | 0.3250 | 0.3000 | 0.3000 |
| 57 | 35 | 18 | 11 | 12 | 0.5143 | 0.3000 | 0.3500 |
| 58 | 18 | 10 | 5 | 6 | 0.5556 | 0.3000 | 0.3500 |
| 59 | 11 | 4 | 3 | 4 | 0.3636 | 0.3000 | 0.3500 |
| 60 & Up | 9 | 8 | 9 | 9 | 0.8889 | 1.0000 | 1.0000 |
| Total | 414 | 130 | 112 | 110 | 0.3140 | 0.2705 | 0.2657 |

RATES OF UNREDUCED RETIREMENT EXPERIENCE FOR UNIFORMED MEMBERS



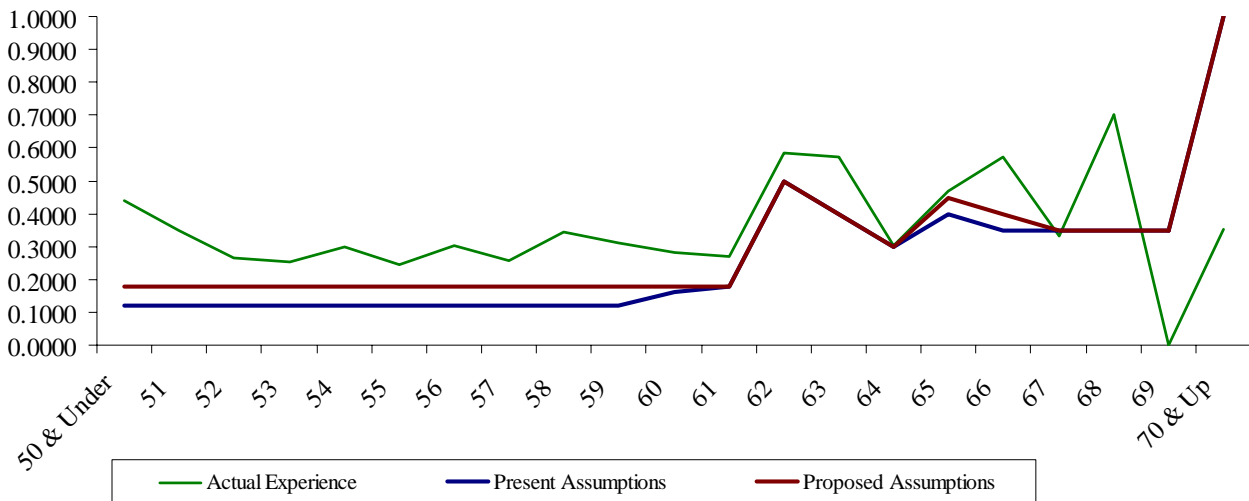
NON-UNIFORMED MALES NORMAL RETIREMENT EXPERIENCE

There were 1,225 age and service unreduced retirements and 3,783 life years of exposure (exposure includes active members eligible for unreduced retirement) in the male retirement investigation.

SUMMARY OF NON-UNIFORMED MALES AGE & SERVICE UNREDUCED RETIREMENT EXPERIENCE

| Age | Life Years Exposure | Number of Retirements | | | Retirement Rates | | |
|--------------|---------------------|-----------------------|------------|------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 50 & Under | 120 | 53 | 14 | 22 | 0.4417 | 0.1200 | 0.1800 |
| 51 | 219 | 76 | 26 | 39 | 0.3470 | 0.1200 | 0.1800 |
| 52 | 271 | 72 | 33 | 49 | 0.2657 | 0.1200 | 0.1800 |
| 53 | 337 | 85 | 40 | 61 | 0.2522 | 0.1200 | 0.1800 |
| 54 | 338 | 101 | 41 | 61 | 0.2988 | 0.1200 | 0.1800 |
| 55 | 309 | 76 | 37 | 56 | 0.2460 | 0.1200 | 0.1800 |
| 56 | 315 | 95 | 38 | 57 | 0.3016 | 0.1200 | 0.1800 |
| 57 | 298 | 77 | 36 | 54 | 0.2584 | 0.1200 | 0.1800 |
| 58 | 285 | 98 | 34 | 51 | 0.3439 | 0.1200 | 0.1800 |
| 59 | 258 | 80 | 31 | 46 | 0.3101 | 0.1200 | 0.1800 |
| 60 | 285 | 81 | 46 | 51 | 0.2842 | 0.1600 | 0.1800 |
| 61 | 236 | 64 | 42 | 42 | 0.2712 | 0.1800 | 0.1800 |
| 62 | 221 | 129 | 111 | 111 | 0.5837 | 0.5000 | 0.5000 |
| 63 | 101 | 58 | 40 | 40 | 0.5743 | 0.4000 | 0.4000 |
| 64 | 56 | 17 | 17 | 17 | 0.3036 | 0.3000 | 0.3000 |
| 65 | 64 | 30 | 26 | 29 | 0.4688 | 0.4000 | 0.4500 |
| 66 | 28 | 16 | 10 | 11 | 0.5714 | 0.3500 | 0.4000 |
| 67 | 12 | 4 | 4 | 4 | 0.3333 | 0.3500 | 0.3500 |
| 68 | 10 | 7 | 3 | 3 | 0.7000 | 0.3500 | 0.3500 |
| 69 | 3 | 0 | 1 | 1 | 0.0000 | 0.3500 | 0.3500 |
| 70 & Up | 17 | 6 | 17 | 17 | 0.3529 | 1.0000 | 1.0000 |
| Total | 3,783 | 1,225 | 647 | 822 | 0.3238 | 0.1710 | 0.2173 |

RATES OF UNREDUCED RETIREMENT EXPERIENCE FOR NON-UNIFORMED MALES



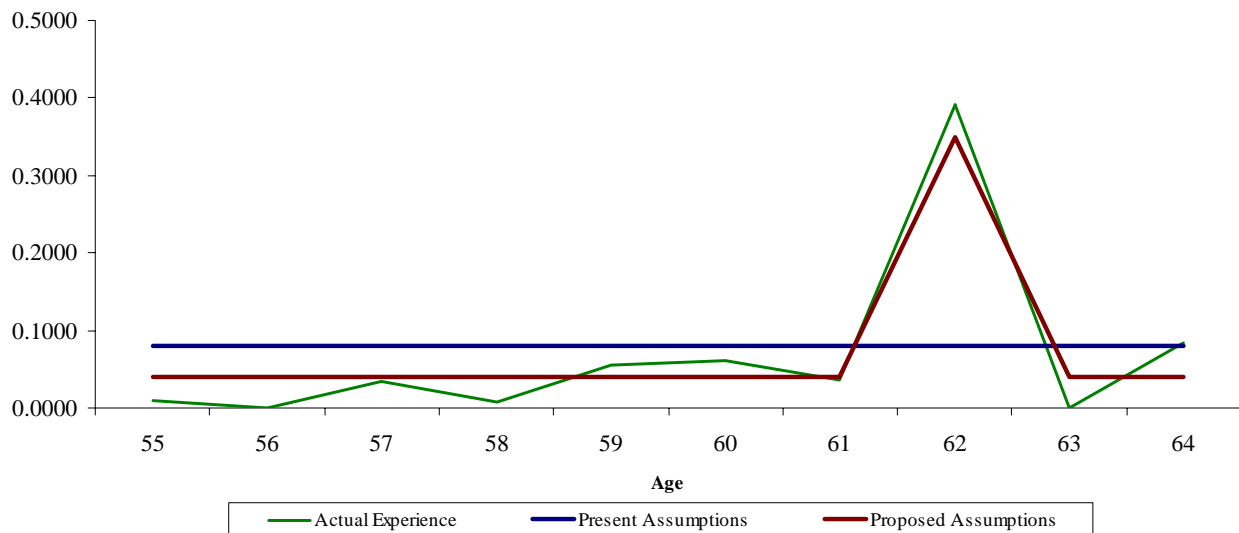
NON-UNIFORMED MALES EARLY RETIREMENT EXPERIENCE

There were 27 age and service reduced retirements and 890 life years of exposure (exposure includes active members eligible for reduced retirement) in the male retirement investigation.

SUMMARY OF NON-UNIFORMED MALES AGE & SERVICE REDUCED RETIREMENT EXPERIENCE

| Age | Life Years Exposure | Number of Retirements | | | Retirement Rates | | |
|--------------|---------------------|-----------------------|-------------|-------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 55 | 217 | 2 | 17.4 | 8.7 | 0.0092 | 0.0800 | 0.0400 |
| 56 | 182 | 0 | 14.6 | 7.3 | 0.0000 | 0.0800 | 0.0400 |
| 57 | 148 | 5 | 11.8 | 5.9 | 0.0338 | 0.0800 | 0.0400 |
| 58 | 123 | 1 | 9.8 | 4.9 | 0.0081 | 0.0800 | 0.0400 |
| 59 | 109 | 6 | 8.7 | 4.4 | 0.0550 | 0.0800 | 0.0400 |
| 60 | 33 | 2 | 2.6 | 1.3 | 0.0606 | 0.0800 | 0.0400 |
| 61 | 27 | 1 | 2.2 | 1.1 | 0.0370 | 0.0800 | 0.0400 |
| 62 | 23 | 9 | 1.8 | 8.0 | 0.3913 | 0.0800 | 0.3500 |
| 63 | 16 | 0 | 1.3 | 0.6 | 0.0000 | 0.0800 | 0.0400 |
| 64 | 12 | 1 | 1.0 | 0.5 | 0.0833 | 0.0800 | 0.0400 |
| Total | 890 | 27 | 71.2 | 42.7 | 0.0303 | 0.0800 | 0.0480 |

RATES OF REDUCED RETIREMENT EXPERIENCE FOR NON-UNIFORMED MALES



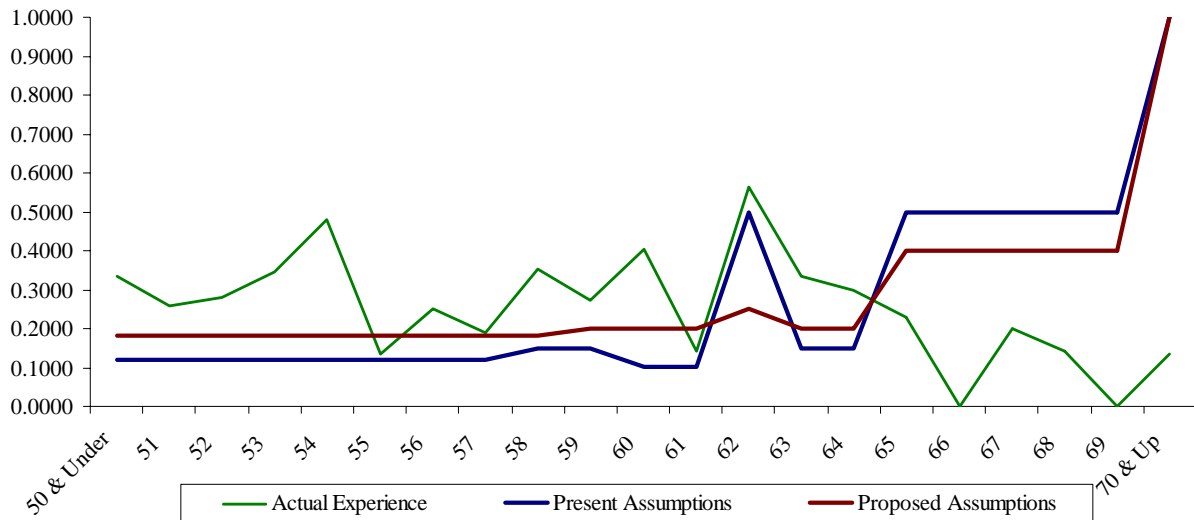
NON-UNIFORMED FEMALES NORMAL RETIREMENT EXPERIENCE

There were 125 age and service unreduced retirements and 429 life years of exposure (exposure includes active members eligible for unreduced retirement) in the female retirement investigation.

SUMMARY OF NON-UNIFORMED FEMALES AGE & SERVICE UNREDUCED RETIREMENT EXPERIENCE

| Age | Life Years Exposure | Number of Retirements | | | Retirement Rates | | |
|--------------|---------------------|-----------------------|------------|------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 50 & Under | 30 | 10 | 4 | 5 | 0.3333 | 0.1200 | 0.1800 |
| 51 | 35 | 9 | 4 | 6 | 0.2571 | 0.1200 | 0.1800 |
| 52 | 32 | 9 | 4 | 6 | 0.2813 | 0.1200 | 0.1800 |
| 53 | 26 | 9 | 3 | 5 | 0.3462 | 0.1200 | 0.1800 |
| 54 | 25 | 12 | 3 | 5 | 0.4800 | 0.1200 | 0.1800 |
| 55 | 15 | 2 | 2 | 3 | 0.1333 | 0.1200 | 0.1800 |
| 56 | 20 | 5 | 2 | 4 | 0.2500 | 0.1200 | 0.1800 |
| 57 | 16 | 3 | 2 | 3 | 0.1875 | 0.1200 | 0.1800 |
| 58 | 17 | 6 | 3 | 3 | 0.3529 | 0.1500 | 0.1800 |
| 59 | 22 | 6 | 3 | 4 | 0.2727 | 0.1500 | 0.2000 |
| 60 | 37 | 15 | 4 | 7 | 0.4054 | 0.1000 | 0.2000 |
| 61 | 28 | 4 | 3 | 6 | 0.1429 | 0.1000 | 0.2000 |
| 62 | 32 | 18 | 16 | 8 | 0.5625 | 0.5000 | 0.2500 |
| 63 | 15 | 5 | 2 | 3 | 0.3333 | 0.1500 | 0.2000 |
| 64 | 10 | 3 | 2 | 2 | 0.3000 | 0.1500 | 0.2000 |
| 65 | 13 | 3 | 7 | 5 | 0.2308 | 0.5000 | 0.4000 |
| 66 | 11 | 0 | 6 | 4 | 0.0000 | 0.5000 | 0.4000 |
| 67 | 10 | 2 | 5 | 4 | 0.2000 | 0.5000 | 0.4000 |
| 68 | 7 | 1 | 4 | 3 | 0.1429 | 0.5000 | 0.4000 |
| 69 | 6 | 0 | 3 | 2 | 0.0000 | 0.5000 | 0.4000 |
| 70 & Up | 22 | 3 | 22 | 22 | 0.1364 | 1.0000 | 1.0000 |
| Total | 429 | 125 | 104 | 110 | 0.2914 | 0.2424 | 0.2564 |

RATES OF UNREDUCED RETIREMENT EXPERIENCE FOR NON-UNIFORMED FEMALES



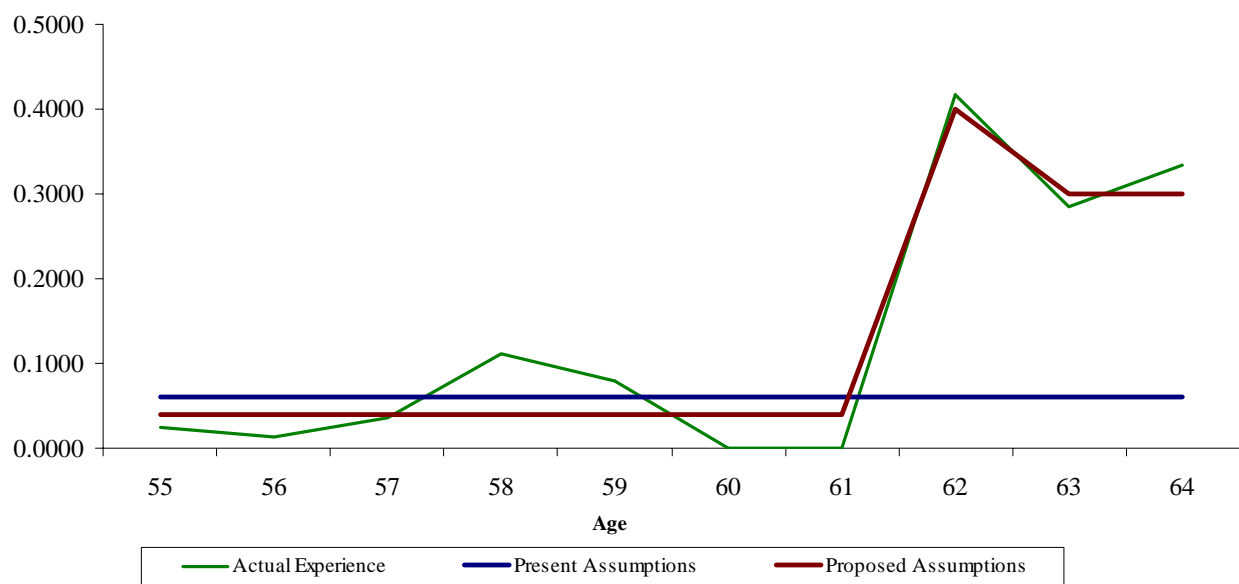
NON-UNIFORMED FEMALES EARLY RETIREMENT EXPERIENCE

There were 22 age and service reduced retirements and 346 life years of exposure (exposure includes active members eligible for reduced retirement) in the female retirement investigation.

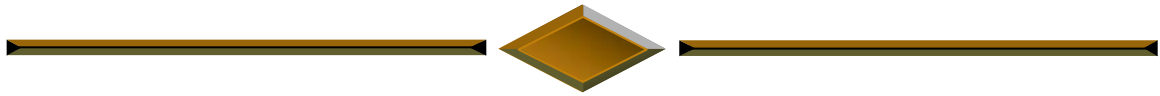
SUMMARY OF NON-UNIFORMED FEMALES AGE & SERVICE REDUCED RETIREMENT EXPERIENCE

| Age | Life Years Exposure | Number of Retirements | | | Retirement Rates | | |
|--------------|---------------------|-----------------------|-------------|-------------|------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 55 | 84 | 2 | 5.0 | 3.4 | 0.0238 | 0.0600 | 0.0400 |
| 56 | 75 | 1 | 4.5 | 3.0 | 0.0133 | 0.0600 | 0.0400 |
| 57 | 55 | 2 | 3.3 | 2.2 | 0.0364 | 0.0600 | 0.0400 |
| 58 | 45 | 5 | 2.7 | 1.8 | 0.1111 | 0.0600 | 0.0400 |
| 59 | 38 | 3 | 2.3 | 1.5 | 0.0789 | 0.0600 | 0.0400 |
| 60 | 11 | 0 | 0.7 | 0.4 | 0.0000 | 0.0600 | 0.0400 |
| 61 | 13 | 0 | 0.8 | 0.5 | 0.0000 | 0.0600 | 0.0400 |
| 62 | 12 | 5 | 0.7 | 4.8 | 0.4167 | 0.0600 | 0.4000 |
| 63 | 7 | 2 | 0.4 | 2.1 | 0.2857 | 0.0600 | 0.3000 |
| 64 | 6 | 2 | 0.4 | 2.0 | 0.3333 | 0.0600 | 0.3000 |
| Total | 346 | 22 | 20.8 | 21.7 | 0.0636 | 0.0600 | 0.0627 |

RATES OF REDUCED RETIREMENT EXPERIENCE FOR NON-UNIFORMED FEMALES



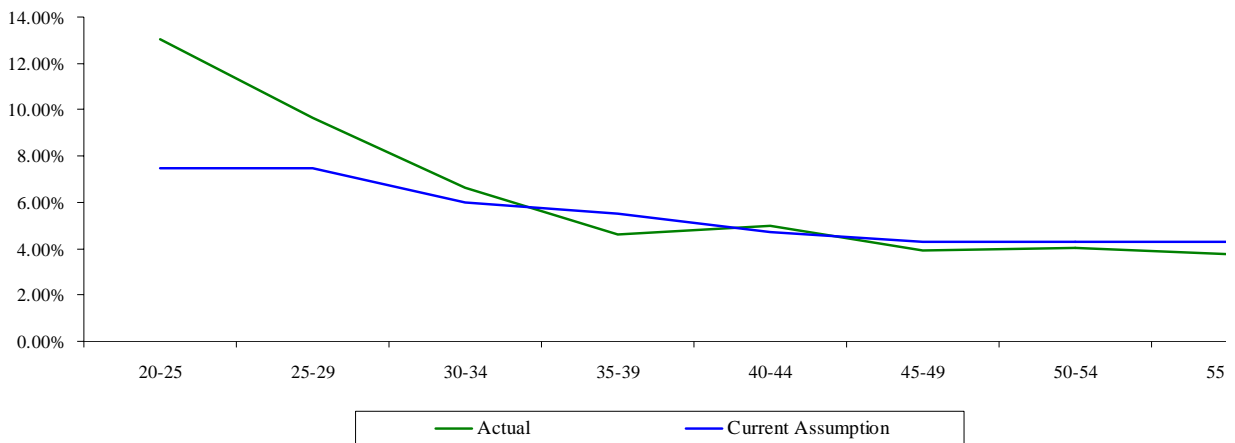
**PAY INCREASES
MERIT & LONGEVITY PORTION**



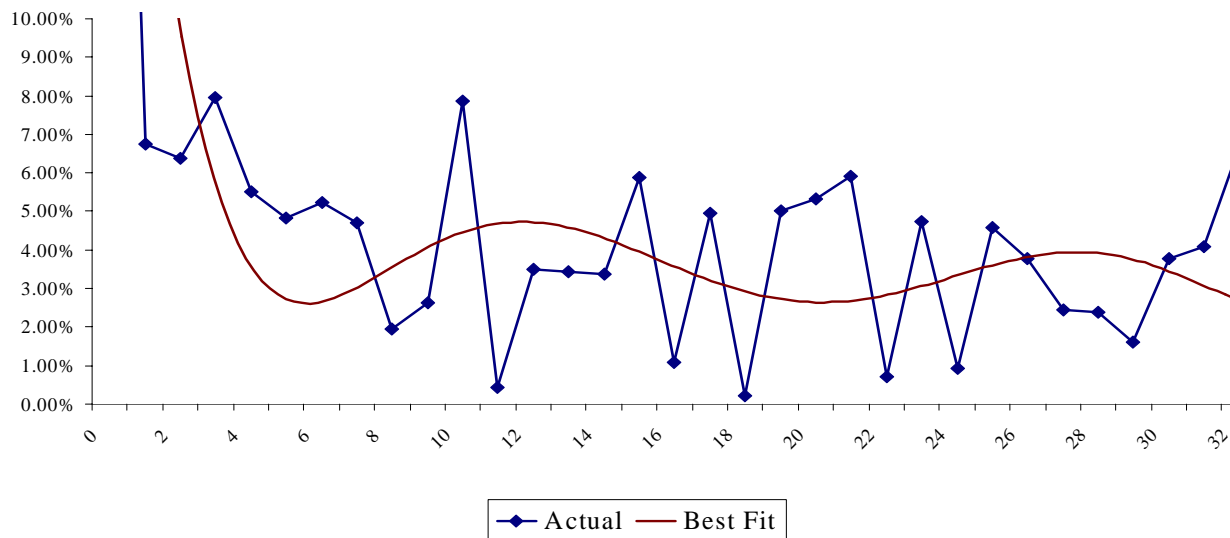
UNIFORMED MEMBERS GROSS PAY INCREASE ASSUMPTIONS

The graphs shown below illustrate gross rates of salary increases for Uniformed Members, according to age and service respectively. They demonstrate that rates of salary increases are highly correlated with age. New rates (merit and longevity portion only) are shown on the following page.

GROSS SALARY INCREASES – CORRELATION BY AGE



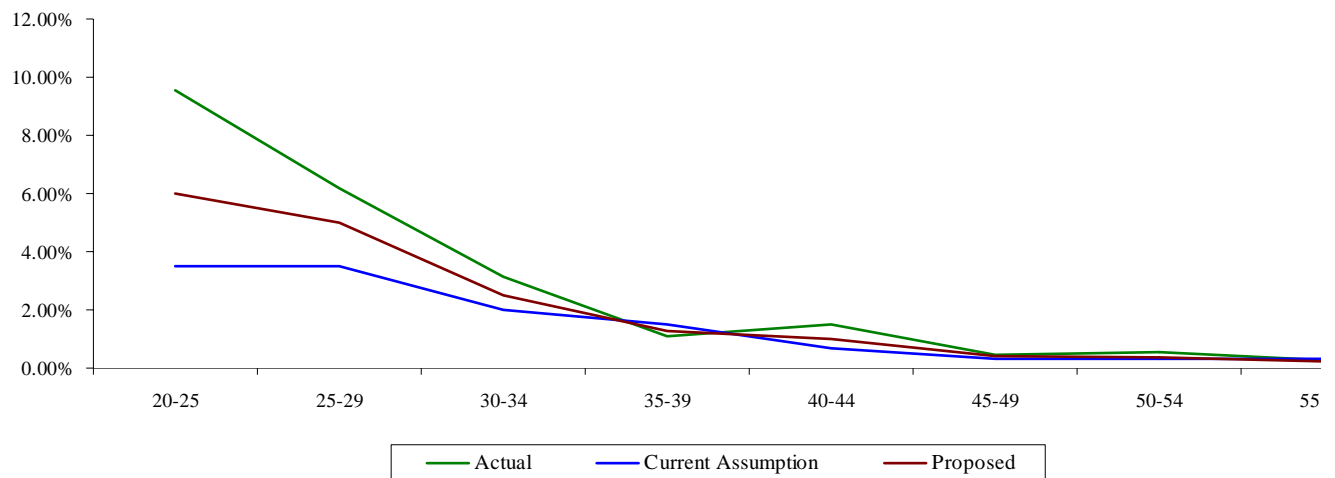
GROSS SALARY INCREASES – CORRELATION BY SERVICE



UNIFORMED MEMBERS MERIT & LONGEVITY PAY INCREASE ASSUMPTIONS

| Age Group Beginning of Year | Number | Actual | Expected | Proposed | Age Group Beginning of Year |
|-----------------------------|--------------|--------|----------|----------|-----------------------------|
| 20-25 | 151 | 9.55% | 3.50 % | 6.00 % | 20-25 |
| 25-29 | 843 | 6.18% | 3.50 % | 5.00 % | 25-29 |
| 30-34 | 1,330 | 3.15% | 2.00 % | 2.50 % | 30-34 |
| 35-39 | 935 | 1.09% | 1.50 % | 1.25 % | 35-39 |
| 40-44 | 662 | 1.51% | 0.70 % | 1.00 % | 40-44 |
| 45-49 | 656 | 0.43% | 0.30 % | 0.40 % | 45-49 |
| 50-54 | 406 | 0.55% | 0.30 % | 0.35 % | 50-54 |
| 55-59 | 88 | 0.25% | 0.30 % | 0.25 % | 55-59 |
| Total | 5,071 | | | | Total |

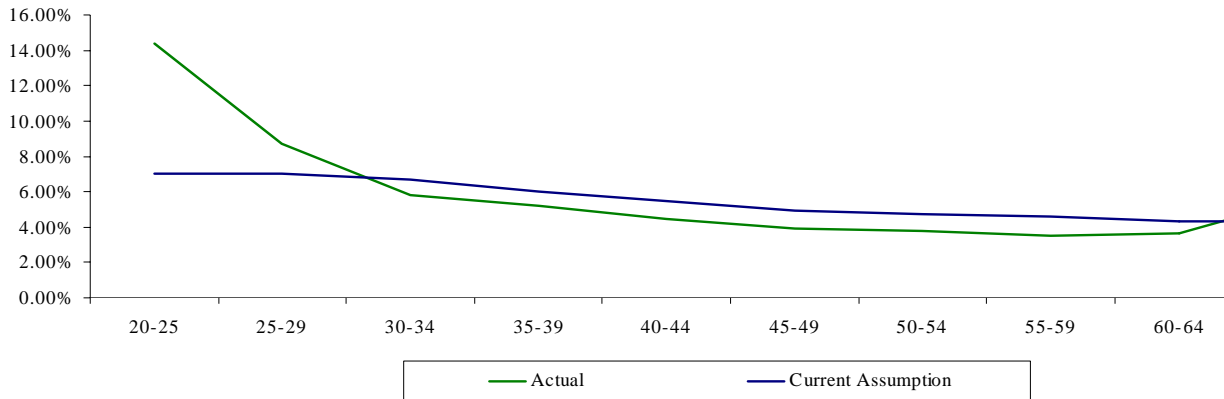
RATES OF SALARY INCREASES



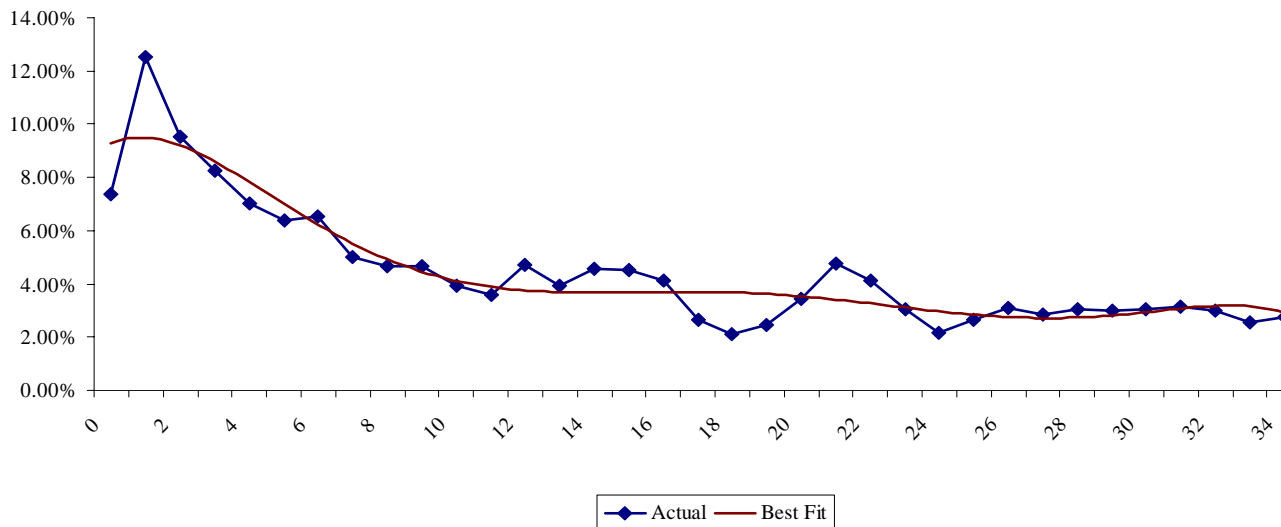
NON-UNIFORMED MEMBERS GROSS PAY INCREASE ASSUMPTIONS

The graphs shown below illustrate rates of gross salary increases for Non-Uniformed Members, according to age and service respectively. They demonstrate that rates of salary increases are highly correlated with age. New rates (merit and longevity portion only) are shown on the following page.

GROSS SALARY INCREASES – CORRELATION BY AGE



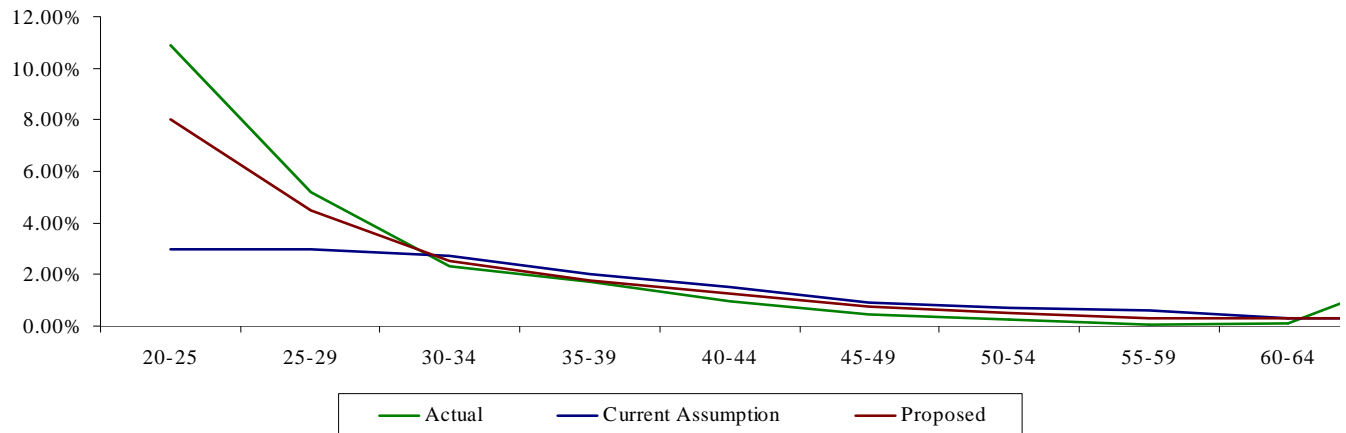
GROSS SALARY INCREASES – CORRELATION BY SERVICE



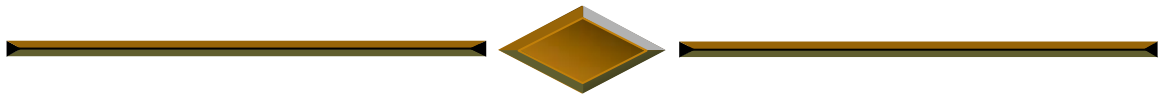
NON-UNIFORMED MEMBERS MERIT & LONGEVITY PAY INCREASE ASSUMPTIONS

| Age Group Beginning of Year | Number | Actual | Expected | Proposed | Age Group Beginning of Year |
|-----------------------------|---------------|--------|----------|----------|-----------------------------|
| 20-25 | 1,379 | 10.87% | 3.00 % | 8.00 % | 20-25 |
| 25-29 | 3,085 | 5.19% | 3.00 % | 4.50 % | 25-29 |
| 30-34 | 4,369 | 2.31% | 2.70 % | 2.50 % | 30-34 |
| 35-39 | 5,588 | 1.71% | 2.00 % | 1.75 % | 35-39 |
| 40-44 | 6,786 | 0.96% | 1.50 % | 1.25 % | 40-44 |
| 45-49 | 6,246 | 0.44% | 0.90 % | 0.75 % | 45-49 |
| 50-54 | 4,670 | 0.25% | 0.70 % | 0.50 % | 50-54 |
| 55-59 | 2,599 | 0.04% | 0.60 % | 0.30 % | 55-59 |
| 60-64 | 843 | 0.12% | 0.30 % | 0.30 % | 60-64 |
| 65 & Over | 125 | 2.17% | 0.30 % | 0.30 % | 65 & Over |
| Total | 35,690 | | | | Total |

RATES OF SALARY INCREASES



MORTALITY EXPERIENCE



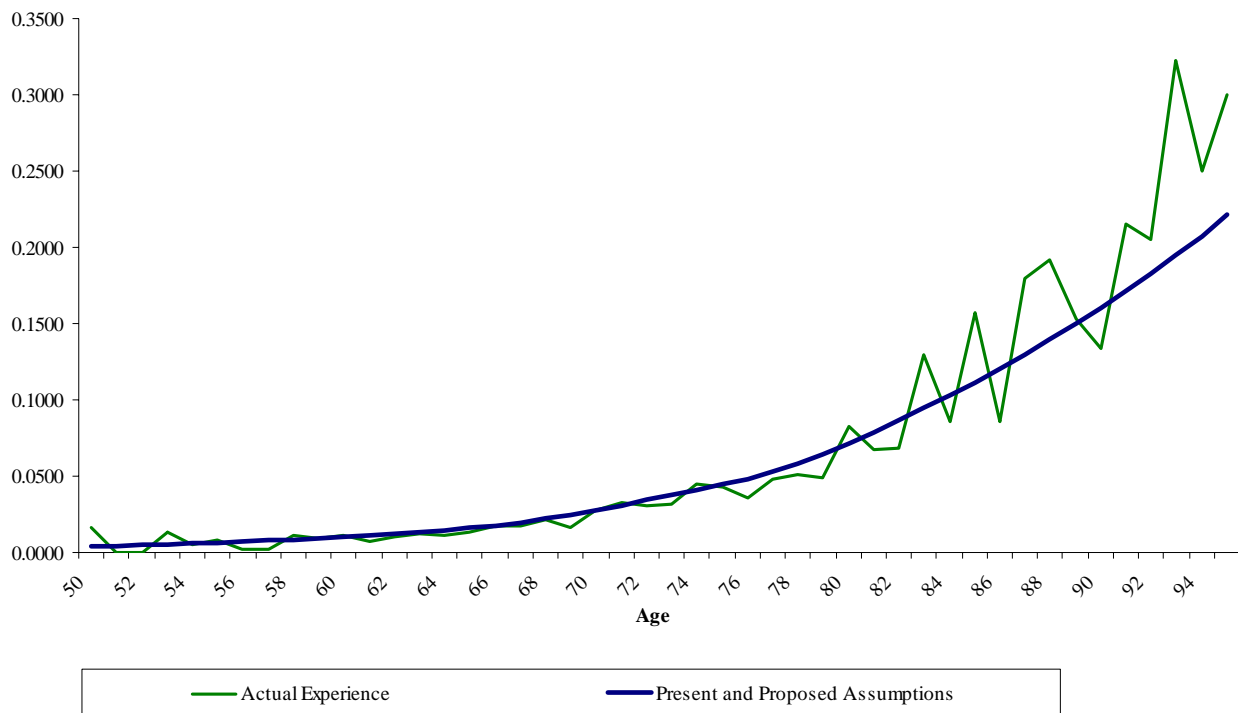
MALE RETIRED-LIFE MORTALITY EXPERIENCE (NORMAL RETIREMENT, ORIGINAL ANNUITANTS ONLY)

There were 645 retired member deaths reported for the 5-year period and 20,837 life years of exposure included in the male retired-life mortality investigation. There were fewer deaths than expected among retired males.

SUMMARY OF MALE RETIRED LIVES MORTALITY EXPERIENCE

| Age | Life Years Exposure | Post - Retirement Death | | | Post - Retirement Death Rates | | |
|---------------|---------------------|-------------------------|--------------|--------------|-------------------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 50-54 | 1,107 | 7 | 5.0 | 5.0 | 0.0063 | 0.0049 | 0.0049 |
| 55-59 | 2,930 | 19 | 22.0 | 22.0 | 0.0065 | 0.0077 | 0.0077 |
| 60-64 | 4,023 | 42 | 48.0 | 48.0 | 0.0104 | 0.0120 | 0.0120 |
| 65-69 | 4,427 | 75 | 87.0 | 87.0 | 0.0169 | 0.0197 | 0.0197 |
| 70-74 | 3,547 | 116 | 121.0 | 121.0 | 0.0327 | 0.0342 | 0.0342 |
| 75-79 | 2,422 | 109 | 128.0 | 128.0 | 0.0450 | 0.0529 | 0.0529 |
| 80-84 | 1,498 | 127 | 130.0 | 130.0 | 0.0848 | 0.0865 | 0.0865 |
| 85-89 | 642 | 96 | 83.0 | 83.0 | 0.1495 | 0.1299 | 0.1299 |
| 90-94 | 201 | 42 | 37.0 | 37.0 | 0.2090 | 0.1829 | 0.1829 |
| 95 & Up | 40 | 12 | 10.0 | 10.0 | 0.3000 | 0.2532 | 0.2532 |
| Totals | 20,837 | 645 | 671.0 | 671.0 | 0.0310 | 0.0322 | 0.0322 |

RATES OF MALE RETIRED LIVES MORTALITY EXPERIENCE



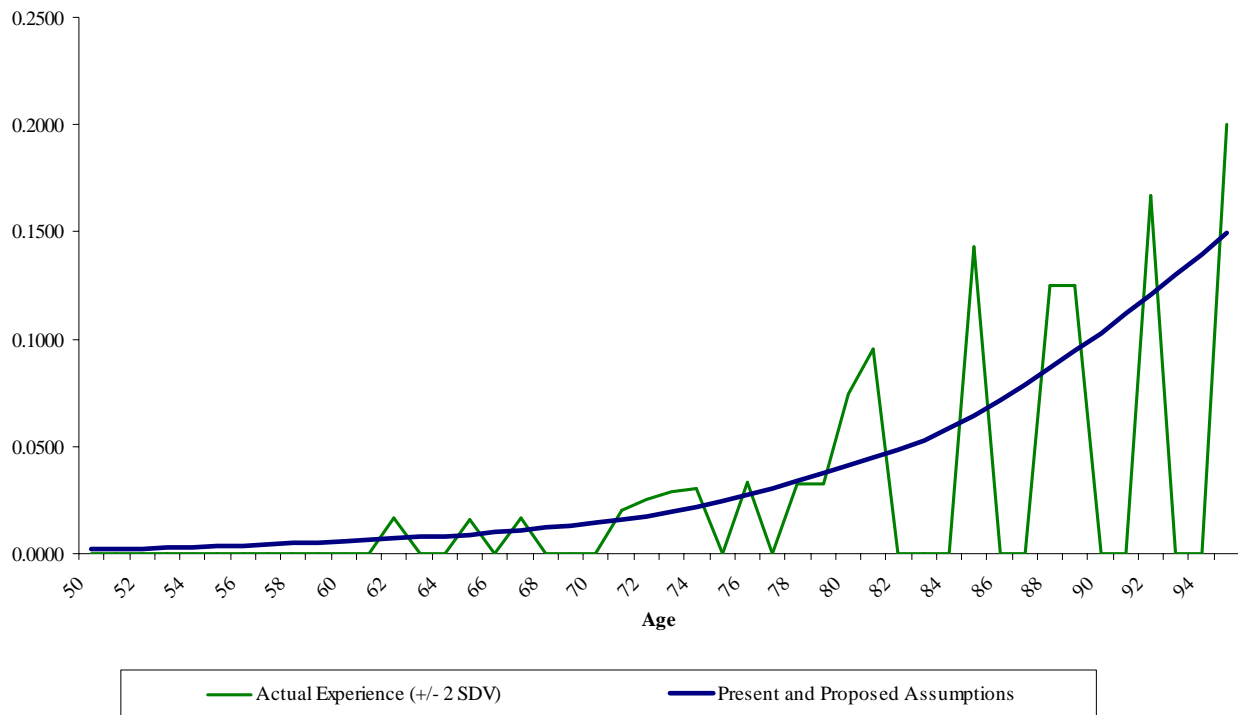
FEMALE RETIRED-LIFE MORTALITY EXPERIENCE (NORMAL RETIREMENT, ORIGINAL ANNUITANTS ONLY)

There were 19 retired member deaths reported for the 5-year period and 1,356 life years of exposure included in the female retired-life mortality investigation. There were fewer deaths than expected among retired females.

SUMMARY OF FEMALE RETIRED LIVES MORTALITY EXPERIENCE

| Age | Life Years Exposure | Post - Retirement Death | | | Post - Retirement Death Rates | | |
|---------------|---------------------|-------------------------|-------------|-------------|-------------------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 50-54 | 107 | 0 | 0.0 | 0.0 | 0.0000 | 0.0024 | 0.0024 |
| 55-59 | 163 | 0 | 1.0 | 1.0 | 0.0000 | 0.0044 | 0.0044 |
| 60-64 | 292 | 1 | 2.0 | 2.0 | 0.0034 | 0.0071 | 0.0071 |
| 65-69 | 290 | 2 | 3.0 | 3.0 | 0.0069 | 0.0109 | 0.0109 |
| 70-74 | 210 | 4 | 4.0 | 4.0 | 0.0190 | 0.0177 | 0.0177 |
| 75-79 | 153 | 3 | 5.0 | 5.0 | 0.0196 | 0.0307 | 0.0307 |
| 80-84 | 80 | 4 | 4.0 | 4.0 | 0.0500 | 0.0484 | 0.0484 |
| 85-89 | 37 | 3 | 3.0 | 3.0 | 0.0811 | 0.0787 | 0.0787 |
| 90-94 | 19 | 1 | 2.0 | 2.0 | 0.0526 | 0.1206 | 0.1206 |
| 95 & Up | 5 | 1 | 1.0 | 1.0 | 0.2000 | 0.1713 | 0.1713 |
| Totals | 1,356 | 19 | 25.0 | 25.0 | 0.0140 | 0.0184 | 0.0184 |

RATES OF FEMALE RETIRED LIVES MORTALITY EXPERIENCE



MALE DEATH-IN-SERVICE EXPERIENCE

There were 43 active male deaths reported for the 5-year period and 29,818 life years of exposure included in the male active mortality investigation.

MALE DEATHS

| Age | Life Years Exposure | Pre - Retirement Death | | | Pre - Retirement Death Rates | | |
|---------------|---------------------------|------------------------|-------------|-------------|------------------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| Under 30 | 2,337 | 2 | 1.0 | 1.0 | 0.0009 | 0.0003 | 0.0003 |
| 30-34 | 3,888 | 3 | 1.0 | 1.0 | 0.0008 | 0.0004 | 0.0004 |
| 35-39 | 4,505 | 1 | 2.0 | 2.0 | 0.0002 | 0.0005 | 0.0005 |
| 40-44 | 5,389 | 6 | 4.0 | 4.0 | 0.0011 | 0.0008 | 0.0008 |
| 45-49 | 5,250 | 6 | 8.0 | 8.0 | 0.0011 | 0.0016 | 0.0016 |
| 50-54 | 4,623 | 12 | 12.0 | 12.0 | 0.0026 | 0.0027 | 0.0027 |
| 55-59 | 2,568 | 5 | 11.0 | 11.0 | 0.0019 | 0.0042 | 0.0042 |
| 60-64 | 1,136 | 5 | 7.0 | 7.0 | 0.0044 | 0.0066 | 0.0066 |
| 65-69 | 119 | 1 | 1.0 | 1.0 | 0.0084 | 0.0110 | 0.0110 |
| 70-74 | 1 | - | 0.0 | 0.0 | 0.0000 | 0.0188 | 0.0188 |
| 75-79 | 1 | 1 | 0.0 | 0.0 | 1.0000 | 0.0292 | 0.0292 |
| 80-84 | 1 | 1 | 0.0 | 0.0 | 1.0000 | 0.0472 | 0.0472 |
| 85-89 | - | - | 0.0 | 0.0 | 0.0000 | 0.0698 | 0.0698 |
| 90& Up | - | - | 0.0 | 0.0 | 0.0000 | 0.0974 | 0.0974 |
| Totals | 29,818 | 43 | 47.0 | 47.0 | 0.0014 | 0.0016 | 0.0016 |

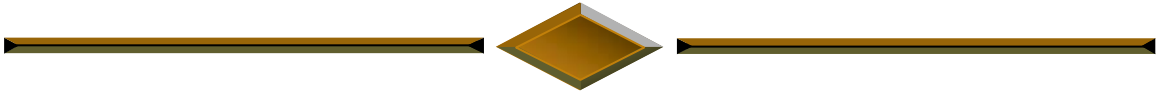
FEMALE DEATH-IN-SERVICE EXPERIENCE

There were no active female deaths reported for the 5-year period and 7,727 life years of exposure included in the female active mortality investigation.

FEMALE DEATHS

| Age | Life Years Exposure | Pre - Retirement Death | | | Pre - Retirement Death Rates | | |
|---------------|---------------------------|------------------------|------------|------------|------------------------------|---------------|---------------|
| | | Actual Experience | Expected | | Actual | Expected | |
| | | | Present | Proposed | | Present | Proposed |
| 20-24 | 82 | - | 0.0 | 0.0 | 0.0000 | 0.0002 | 0.0002 |
| 25-29 | 559 | - | 0.0 | 0.0 | 0.0000 | 0.0002 | 0.0002 |
| 30-34 | 995 | - | 0.0 | 0.0 | 0.0000 | 0.0003 | 0.0003 |
| 35-39 | 1,352 | - | 1.0 | 1.0 | 0.0000 | 0.0004 | 0.0004 |
| 40-44 | 1,579 | - | 1.0 | 1.0 | 0.0000 | 0.0005 | 0.0005 |
| 45-49 | 1,348 | - | 1.0 | 1.0 | 0.0000 | 0.0008 | 0.0008 |
| 50-54 | 1,007 | - | 2.0 | 2.0 | 0.0000 | 0.0016 | 0.0016 |
| 55-59 | 531 | - | 1.0 | 1.0 | 0.0000 | 0.0027 | 0.0027 |
| 60-64 | 225 | - | 1.0 | 1.0 | 0.0000 | 0.0042 | 0.0042 |
| 65-69 | 48 | - | 0.0 | 0.0 | 0.0000 | 0.0066 | 0.0066 |
| 70-74 | 1 | - | 0.0 | 0.0 | 0.0000 | 0.0110 | 0.0110 |
| 75-79 | - | - | 0.0 | 0.0 | 0.0000 | 0.0188 | 0.0188 |
| 80-84 | - | - | 0.0 | 0.0 | 0.0000 | 0.0292 | 0.0292 |
| 85-89 | - | - | 0.0 | 0.0 | 0.0000 | 0.0472 | 0.0472 |
| 90& Up | - | - | 0.0 | 0.0 | 0.0000 | 0.0698 | 0.0698 |
| Totals | 7,727 | 0 | 7.0 | 7.0 | 0.0000 | 0.0009 | 0.0009 |

**COMPLETE LISTS OF
PROPOSED DECREMENT ASSUMPTIONS**



**ACTUARIAL ASSUMPTIONS
BASED ON 1999-2004 EXPERIENCE STUDY**

SELECT AND ULTIMATE WITHDRAWAL

| Age | Service | % of Active Participants Withdrawing | | | |
|-----|---------|--------------------------------------|--------|-----------------------|--------|
| | | Uniformed Members | | Non-Uniformed Members | |
| | | Male | Female | Male | Female |
| | 0-1 | 8.0% | 8.0% | 25.0% | 18.0% |
| | 1-2 | 6.0% | 6.0% | 12.0% | 11.0% |
| | 2-3 | 4.5% | 4.5% | 7.0% | 9.0% |
| | 3-4 | 3.0% | 3.0% | 6.0% | 7.0% |
| | 4-5 | 2.0% | 2.0% | 5.0% | 6.0% |
| 30 | 5 & Up | 3.8% | 3.8% | 3.8% | 5.6% |
| 31 | | 3.5% | 3.5% | 3.5% | 5.4% |
| 32 | | 3.3% | 3.3% | 3.4% | 5.3% |
| 33 | | 2.9% | 2.9% | 3.2% | 5.1% |
| 34 | | 2.6% | 2.6% | 3.0% | 5.0% |
| 35 | | 2.2% | 2.2% | 2.9% | 4.8% |
| 36 | | 1.9% | 1.9% | 2.7% | 4.7% |
| 37 | | 1.5% | 1.5% | 2.5% | 4.5% |
| 38 | | 1.4% | 1.4% | 2.3% | 4.3% |
| 39 | | 1.3% | 1.3% | 2.1% | 4.0% |
| 40 | | 1.2% | 1.2% | 2.0% | 3.8% |
| 41 | | 1.1% | 1.1% | 1.8% | 3.5% |
| 42 | | 1.0% | 1.0% | 1.6% | 3.3% |
| 43 | | 0.9% | 0.9% | 1.5% | 3.2% |
| 44 | | 0.9% | 0.9% | 1.4% | 3.2% |
| 45 | | 0.8% | 0.8% | 1.3% | 3.1% |
| 46 | | 0.8% | 0.8% | 1.2% | 3.1% |
| 47 | | 0.7% | 0.7% | 1.1% | 3.0% |
| 48 | | 0.6% | 0.6% | 1.1% | 3.0% |
| 49 | | 0.5% | 0.5% | 1.0% | 3.0% |
| 50 | | 0.5% | 0.5% | 1.0% | 3.0% |
| 51 | | 0.4% | 0.4% | 0.9% | 3.0% |
| 52 | | 0.3% | 0.3% | 0.9% | 3.0% |
| 53 | | 0.3% | 0.3% | 0.8% | 2.5% |
| 54 | | 0.2% | 0.2% | 0.7% | 2.0% |
| 55 | | 0.2% | 0.2% | 0.7% | 1.5% |
| 56 | | 0.1% | 0.1% | 0.6% | 1.0% |
| 57 | | 0.1% | 0.1% | 0.5% | 0.5% |
| 58 | | 0.1% | 0.1% | 0.4% | 0.5% |
| 59 | | 0.1% | 0.1% | 0.3% | 0.5% |
| 60 | | 0.1% | 0.1% | 0.2% | 0.5% |
| Ref | | 13 | 13 | 353 | 352 |
| | | 659 | 659 | 660 | 661 |

**ACTUARIAL ASSUMPTIONS
BASED ON 1999-2004 EXPERIENCE STUDY**

DISABILITY RATES

| Age | % of Active Participants Becoming Disabled | | | |
|------------|--|--------|-----------------------|--------|
| | Uniformed Members | | Non-Uniformed Members | |
| | Male | Female | Male | Female |
| 20 | 0.02% | 0.02% | 0.01% | 0.05% |
| 21 | 0.02% | 0.02% | 0.01% | 0.05% |
| 22 | 0.02% | 0.02% | 0.01% | 0.05% |
| 23 | 0.02% | 0.02% | 0.01% | 0.05% |
| 24 | 0.02% | 0.02% | 0.01% | 0.05% |
| 25 | 0.03% | 0.03% | 0.01% | 0.06% |
| 26 | 0.03% | 0.03% | 0.01% | 0.06% |
| 27 | 0.03% | 0.03% | 0.01% | 0.06% |
| 28 | 0.03% | 0.03% | 0.01% | 0.06% |
| 29 | 0.03% | 0.03% | 0.01% | 0.07% |
| 30 | 0.03% | 0.03% | 0.01% | 0.07% |
| 31 | 0.03% | 0.03% | 0.02% | 0.08% |
| 32 | 0.04% | 0.04% | 0.03% | 0.08% |
| 33 | 0.04% | 0.04% | 0.04% | 0.09% |
| 34 | 0.04% | 0.04% | 0.05% | 0.10% |
| 35 | 0.04% | 0.04% | 0.06% | 0.10% |
| 36 | 0.05% | 0.05% | 0.07% | 0.11% |
| 37 | 0.05% | 0.05% | 0.07% | 0.12% |
| 38 | 0.05% | 0.05% | 0.08% | 0.13% |
| 39 | 0.05% | 0.05% | 0.08% | 0.15% |
| 40 | 0.06% | 0.06% | 0.09% | 0.16% |
| 41 | 0.06% | 0.06% | 0.11% | 0.18% |
| 42 | 0.07% | 0.07% | 0.14% | 0.20% |
| 43 | 0.07% | 0.07% | 0.16% | 0.23% |
| 44 | 0.08% | 0.08% | 0.19% | 0.26% |
| 45 | 0.09% | 0.09% | 0.21% | 0.29% |
| 46 | 0.10% | 0.10% | 0.24% | 0.32% |
| 47 | 0.11% | 0.11% | 0.27% | 0.35% |
| 48 | 0.13% | 0.13% | 0.30% | 0.38% |
| 49 | 0.14% | 0.14% | 0.33% | 0.41% |
| 50 | 0.15% | 0.15% | 0.36% | 0.45% |
| 51 | 0.17% | 0.17% | 0.42% | 0.50% |
| 52 | 0.19% | 0.19% | 0.48% | 0.58% |
| 53 | 0.22% | 0.22% | 0.54% | 0.69% |
| 54 | 0.25% | 0.25% | 0.60% | 0.82% |
| 55 | 0.00% | 0.00% | 0.66% | 0.54% |
| 56 | 0.00% | 0.00% | 0.66% | 0.67% |
| 57 | 0.00% | 0.00% | 0.66% | 0.83% |
| 58 | 0.00% | 0.00% | 0.66% | 0.99% |
| 59 | 0.00% | 0.00% | 0.66% | 1.15% |
| 60 | 0.00% | 0.00% | 0.00% | 0.00% |
| Ref | 228 | 228 | 226 | 227 |
| Multiplier | 60% | 60% | 60% | 85% |

**ACTUARIAL ASSUMPTIONS
BASED ON 1999-2004 EXPERIENCE STUDY**

SALARY SCALE – AGE BASED RATES

| Age | % Merit Increases in Salaries Next Year | |
|-----|---|-----------------------|
| | Uniformed Members | Non-Uniformed Members |
| | 20 | 6.0% |
| 21 | 6.0% | 8.0% |
| 22 | 6.0% | 8.0% |
| 23 | 5.8% | 7.3% |
| 24 | 5.6% | 6.5% |
| 25 | 5.4% | 5.7% |
| 26 | 5.2% | 4.7% |
| 27 | 5.0% | 4.5% |
| 28 | 4.5% | 4.1% |
| 29 | 4.0% | 3.7% |
| 30 | 3.5% | 3.3% |
| 31 | 3.0% | 2.9% |
| 32 | 2.5% | 2.5% |
| 33 | 2.3% | 2.3% |
| 34 | 2.0% | 2.2% |
| 35 | 1.8% | 2.1% |
| 36 | 1.5% | 1.9% |
| 37 | 1.3% | 1.8% |
| 38 | 1.2% | 1.6% |
| 39 | 1.2% | 1.5% |
| 40 | 1.1% | 1.4% |
| 41 | 1.0% | 1.4% |
| 42 | 1.0% | 1.3% |
| 43 | 0.9% | 1.2% |
| 44 | 0.8% | 1.0% |
| 45 | 0.6% | 0.9% |
| 46 | 0.5% | 0.9% |
| 47 | 0.4% | 0.7% |
| 48 | 0.4% | 0.7% |
| 49 | 0.4% | 0.7% |
| 50 | 0.4% | 0.6% |
| 51 | 0.4% | 0.5% |
| 52 | 0.4% | 0.5% |
| 53 | 0.3% | 0.5% |
| 54 | 0.3% | 0.4% |
| 55 | 0.3% | 0.4% |
| 56 | 0.3% | 0.3% |
| 57 | 0.2% | 0.3% |
| 58 | 0.0% | 0.3% |
| 59 | 0.0% | 0.3% |
| 60 | 0.0% | 0.3% |
| 61 | 0.0% | 0.3% |
| 62 | 0.0% | 0.3% |
| 63 | 0.0% | 0.3% |
| 64 | 0.0% | 0.3% |
| 65 | 0.0% | 0.3% |
| 66 | 0.0% | 0.3% |
| 67 | 0.0% | 0.3% |
| 68 | 0.0% | 0.3% |
| 69 | 0.0% | 0.3% |
| 70 | 0.0% | 0.3% |
| Ref | 162 | 161 |

**ACTUARIAL ASSUMPTIONS
 BASED ON 1999-2004 EXPERIENCE STUDY**

NORMAL RETIREMENT PATTERN

| Age | % of Active Participants Retiring | | | |
|-----|-----------------------------------|--------|-----------------------|--------|
| | Uniformed Members | | Non-Uniformed Members | |
| | Male | Female | Male | Female |
| 50 | 50% | 50% | 18% | 18% |
| 51 | 25% | 25% | 18% | 18% |
| 52 | 20% | 20% | 18% | 18% |
| 53 | 20% | 20% | 18% | 18% |
| 54 | 20% | 20% | 18% | 18% |
| 55 | 25% | 25% | 18% | 18% |
| 56 | 30% | 30% | 18% | 18% |
| 57 | 35% | 35% | 18% | 18% |
| 58 | 35% | 35% | 18% | 18% |
| 59 | 35% | 35% | 18% | 20% |
| 60 | 100% | 100% | 18% | 20% |
| 61 | 100% | 100% | 18% | 20% |
| 62 | 100% | 100% | 50% | 25% |
| 63 | 100% | 100% | 40% | 20% |
| 64 | 100% | 100% | 30% | 20% |
| 65 | 100% | 100% | 45% | 40% |
| 66 | 100% | 100% | 40% | 40% |
| 67 | 100% | 100% | 35% | 40% |
| 68 | 100% | 100% | 35% | 40% |
| 69 | 100% | 100% | 35% | 40% |
| 70 | 100% | 100% | 100% | 100% |
| Ref | 475 | 475 | 888 | 909 |

**ACTUARIAL ASSUMPTIONS
BASED ON 1999-2004 EXPERIENCE STUDY**

EARLY RETIREMENT PATTERN

| Age | % of Active Participants Retiring | |
|-----|-----------------------------------|--------|
| | Non-Uniformed Members | |
| | Male | Female |
| 55 | 4% | 4% |
| 56 | 4% | 4% |
| 57 | 4% | 4% |
| 58 | 4% | 4% |
| 59 | 4% | 4% |
| 60 | 4% | 4% |
| 61 | 4% | 4% |
| 62 | 35% | 40% |
| 63 | 4% | 30% |
| 64 | 4% | 30% |

Ref 910 925

**ACTUARIAL ASSUMPTIONS
 BASED ON 1999-2004 EXPERIENCE STUDY
 RETIRED LIVES MORTALITY RATES**

| Age | % Dying Next Year | | Age | % Dying Next Year | | Age | % Dying Next Year | |
|-----|-------------------|---------|-----|-------------------|----------|-----|-------------------|-----------|
| | Male | Female | | Male | Female | | Male | Female |
| 20 | 0.0402% | 0.0342% | 60 | 0.9869% | 0.5899% | 100 | 30.9125% | 20.6895% |
| 21 | 0.0416% | 0.0349% | 61 | 1.0858% | 0.6461% | 101 | 32.9825% | 22.1338% |
| 22 | 0.0432% | 0.0358% | 62 | 1.1952% | 0.7051% | 102 | 35.2455% | 23.7003% |
| 23 | 0.0450% | 0.0367% | 63 | 1.3130% | 0.7666% | 103 | 37.7220% | 25.3249% |
| 24 | 0.0468% | 0.0378% | 64 | 1.4413% | 0.8309% | 104 | 40.6205% | 27.0904% |
| 25 | 0.0489% | 0.0390% | 65 | 1.5926% | 0.9013% | 105 | 44.1497% | 29.0163% |
| 26 | 0.0512% | 0.0402% | 66 | 1.7700% | 0.9869% | 106 | 48.5182% | 30.9125% |
| 27 | 0.0538% | 0.0416% | 67 | 1.9741% | 1.0858% | 107 | 53.9343% | 32.9825% |
| 28 | 0.0566% | 0.0432% | 68 | 2.2037% | 1.1952% | 108 | 60.6069% | 35.2455% |
| 29 | 0.0598% | 0.0450% | 69 | 2.4514% | 1.3130% | 109 | 68.7444% | 37.7220% |
| 30 | 0.0632% | 0.0468% | 70 | 2.7400% | 1.4413% | 110 | 78.5555% | 40.6205% |
| 31 | 0.0670% | 0.0489% | 71 | 3.0680% | 1.5926% | 111 | 99.9999% | 44.1497% |
| 32 | 0.0712% | 0.0512% | 72 | 3.4194% | 1.7700% | 112 | 100.0000% | 48.5182% |
| 33 | 0.0758% | 0.0538% | 73 | 3.7677% | 1.9741% | 113 | 100.0000% | 53.9343% |
| 34 | 0.0809% | 0.0566% | 74 | 4.1064% | 2.2037% | 114 | 100.0000% | 60.6069% |
| 35 | 0.0866% | 0.0598% | 75 | 4.4550% | 2.4514% | 115 | 100.0000% | 68.7444% |
| 36 | 0.0929% | 0.0632% | 76 | 4.8373% | 2.7400% | 116 | 100.0000% | 78.5555% |
| 37 | 0.0997% | 0.0670% | 77 | 5.2857% | 3.0680% | 117 | 100.0000% | 99.9999% |
| 38 | 0.1072% | 0.0712% | 78 | 5.8349% | 3.4194% | 118 | 100.0000% | 100.0000% |
| 39 | 0.1156% | 0.0758% | 79 | 6.4629% | 3.7677% | 119 | 100.0000% | 100.0000% |
| 40 | 0.1249% | 0.0809% | 80 | 7.1362% | 4.1064% | 120 | 100.0000% | 100.0000% |
| 41 | 0.1352% | 0.0866% | 81 | 7.8749% | 4.4550% | | | |
| 42 | 0.1481% | 0.0929% | 82 | 8.6469% | 4.8373% | | | |
| 43 | 0.1655% | 0.0997% | 83 | 9.4487% | 5.2857% | | | |
| 44 | 0.1871% | 0.1072% | 84 | 10.2932% | 5.8349% | | | |
| 45 | 0.2126% | 0.1156% | 85 | 11.1657% | 6.4629% | | | |
| 46 | 0.2419% | 0.1249% | 86 | 12.0641% | 7.1362% | | | |
| 47 | 0.2746% | 0.1352% | 87 | 12.9938% | 7.8749% | | | |
| 48 | 0.3107% | 0.1481% | 88 | 13.9513% | 8.6469% | | | |
| 49 | 0.3499% | 0.1655% | 89 | 14.9547% | 9.4487% | | | |
| 50 | 0.3923% | 0.1871% | 90 | 16.0121% | 10.2932% | | | |
| 51 | 0.4374% | 0.2126% | 91 | 17.1309% | 11.1657% | | | |
| 52 | 0.4856% | 0.2419% | 92 | 18.2905% | 12.0641% | | | |
| 53 | 0.5363% | 0.2746% | 93 | 19.4779% | 12.9938% | | | |
| 54 | 0.5899% | 0.3107% | 94 | 20.6895% | 13.9513% | | | |
| 55 | 0.6461% | 0.3499% | 95 | 22.1338% | 14.9547% | | | |
| 56 | 0.7051% | 0.3923% | 96 | 23.7003% | 16.0121% | | | |
| 57 | 0.7666% | 0.4374% | 97 | 25.3249% | 17.1309% | | | |
| 58 | 0.8309% | 0.4856% | 98 | 27.0904% | 18.2905% | | | |
| 59 | 0.9013% | 0.5363% | 99 | 29.0163% | 19.4779% | | | |

Ref 152 x 100% 154 x 100%
 Set Back -1 -2

**ACTUARIAL ASSUMPTIONS
BASED ON 1999-2004 EXPERIENCE STUDY**

DEATH-IN-SERVICE RATES

| Age | % Dying Next Year | | Age | % Dying Next Year | | Age | % Dying Next Year | |
|-----|-------------------|---------|-----|-------------------|----------|-----|-------------------|-----------|
| | Male | Female | | Male | Female | | Male | Female |
| 20 | 0.0208% | 0.0179% | 60 | 0.5429% | 0.3525% | 100 | 16.4913% | 11.8501% |
| 21 | 0.0216% | 0.0184% | 61 | 0.5976% | 0.3833% | 101 | 17.6227% | 12.6624% |
| 22 | 0.0225% | 0.0189% | 62 | 0.6565% | 0.4155% | 102 | 18.8610% | 13.5452% |
| 23 | 0.0234% | 0.0195% | 63 | 0.7207% | 0.4506% | 103 | 20.3102% | 14.5082% |
| 24 | 0.0244% | 0.0201% | 64 | 0.7963% | 0.4934% | 104 | 22.0748% | 15.4563% |
| 25 | 0.0256% | 0.0208% | 65 | 0.8850% | 0.5429% | 105 | 24.2591% | 16.4913% |
| 26 | 0.0269% | 0.0216% | 66 | 0.9871% | 0.5976% | 106 | 26.9671% | 17.6227% |
| 27 | 0.0283% | 0.0225% | 67 | 1.1018% | 0.6565% | 107 | 30.3035% | 18.8610% |
| 28 | 0.0299% | 0.0234% | 68 | 1.2257% | 0.7207% | 108 | 34.3722% | 20.3102% |
| 29 | 0.0316% | 0.0244% | 69 | 1.3700% | 0.7963% | 109 | 39.2778% | 22.0748% |
| 30 | 0.0335% | 0.0256% | 70 | 1.5340% | 0.8850% | 110 | 49.9999% | 24.2591% |
| 31 | 0.0356% | 0.0269% | 71 | 1.7097% | 0.9871% | 111 | 50.0000% | 26.9671% |
| 32 | 0.0379% | 0.0283% | 72 | 1.8839% | 1.1018% | 112 | 50.0000% | 30.3035% |
| 33 | 0.0404% | 0.0299% | 73 | 2.0532% | 1.2257% | 113 | 50.0000% | 34.3722% |
| 34 | 0.0433% | 0.0316% | 74 | 2.2275% | 1.3700% | 114 | 50.0000% | 39.2778% |
| 35 | 0.0464% | 0.0335% | 75 | 2.4186% | 1.5340% | 115 | 50.0000% | 49.9999% |
| 36 | 0.0499% | 0.0356% | 76 | 2.6429% | 1.7097% | 116 | 50.0000% | 50.0000% |
| 37 | 0.0536% | 0.0379% | 77 | 2.9174% | 1.8839% | 117 | 50.0000% | 50.0000% |
| 38 | 0.0578% | 0.0404% | 78 | 3.2315% | 2.0532% | 118 | 50.0000% | 50.0000% |
| 39 | 0.0624% | 0.0433% | 79 | 3.5681% | 2.2275% | 119 | 50.0000% | 50.0000% |
| 40 | 0.0676% | 0.0464% | 80 | 3.9375% | 2.4186% | 120 | 100.0000% | 100.0000% |
| 41 | 0.0740% | 0.0499% | 81 | 4.3235% | 2.6429% | | | |
| 42 | 0.0828% | 0.0536% | 82 | 4.7243% | 2.9174% | | | |
| 43 | 0.0936% | 0.0578% | 83 | 5.1466% | 3.2315% | | | |
| 44 | 0.1063% | 0.0624% | 84 | 5.5829% | 3.5681% | | | |
| 45 | 0.1210% | 0.0676% | 85 | 6.0321% | 3.9375% | | | |
| 46 | 0.1373% | 0.0740% | 86 | 6.4969% | 4.3235% | | | |
| 47 | 0.1553% | 0.0828% | 87 | 6.9757% | 4.7243% | | | |
| 48 | 0.1750% | 0.0936% | 88 | 7.4773% | 5.1466% | | | |
| 49 | 0.1961% | 0.1063% | 89 | 8.0060% | 5.5829% | | | |
| 50 | 0.2187% | 0.1210% | 90 | 8.5654% | 6.0321% | | | |
| 51 | 0.2428% | 0.1373% | 91 | 9.1453% | 6.4969% | | | |
| 52 | 0.2682% | 0.1553% | 92 | 9.7389% | 6.9757% | | | |
| 53 | 0.2949% | 0.1750% | 93 | 10.3447% | 7.4773% | | | |
| 54 | 0.3231% | 0.1961% | 94 | 11.0669% | 8.0060% | | | |
| 55 | 0.3525% | 0.2187% | 95 | 11.8501% | 8.5654% | | | |
| 56 | 0.3833% | 0.2428% | 96 | 12.6624% | 9.1453% | | | |
| 57 | 0.4155% | 0.2682% | 97 | 13.5452% | 9.7389% | | | |
| 58 | 0.4506% | 0.2949% | 98 | 14.5082% | 10.3447% | | | |
| 59 | 0.4934% | 0.3231% | 99 | 15.4563% | 11.0669% | | | |

Ref 152 x 50% 154 x 50%



GABRIEL, ROEDER, SMITH & COMPANY
Consultants & Actuaries

One Towne Square ● Suite 800 ● Southfield, Michigan 48076 ● 248-799-9000 ● 800-521-0498 ● fax 248-799-9020

March 29, 2005

Mr. Norm Robinson
Missouri Department of Transportation
and Highway Patrol Employees' Retirement System
1913 Williams Street
Jefferson City, MO 65109

Re: 1999 – 2004 MPERS Experience Study

Dear Norm:

Enclosed are 25 spiral bound copies of the report and one 3-hole punched copy of the 1999 – 2004 MPERS Experience Study.

Sincerely,

A handwritten signature in black ink that reads "Kenneth G. Alberts". The signature is written in a cursive style and is positioned to the left of a vertical red line.

Kenneth G. Alberts

KGA/lr
Enclosures

cc: Brian Murphy