# REPORT ON THE RESULTS OF AN EXPERIENCE STUDY OF THE VERMONT MUNICIPAL EMPLOYEES’ RETIREMENT SYSTEM 

Covering the period July 1, 2003 - June 30, 2008

## buckconsultants <br> an ACS company

April 24, 2009

Board of Trustees<br>Vermont Municipal Employees’ Retirement System<br>Montpelier, Vermont 05609

Dear Board Members:
Section 5062, subsection (k), of Title 24, Chapter 125, Vermont Statutes Annotated, provides that at least once in each five-year period the actuary is to make a study of the System's recent experience to assist in setting assumptions. In accordance with this provision, the results of our experience study covering the five-year period ending June 30, 2008, are described in this report, along with our recommendations for changes in the present assumptions.

The Table of Contents, which immediately follows, outlines the information contained in this report.
I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the Academy to render the actuarial opinions contained herein. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions concerning it.

Respectfully submitted,

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David L. Driscoll, FSA, EA
Principal and Consulting Actuary

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## I. INTRODUCTION

In order to accumulate funds to pay retirement benefits on a reasonable and relatively stable basis, the actuary prepares annual valuations of the System's assets and liabilities to measure the funded status and to ensure that funding is progressing at a rate that is adequate to meet the System's obligations.

The primary purpose of funding is to equitably allocate costs between generations of taxpayers and provide security to members, who view the funds set aside as assurance that their benefits will be paid.

While the ultimate cost of the System is not determinable until all benefits are paid and expenses provided for, each actuarial valuation attempts to estimate costs based on assumptions selected to predict, as accurately as possible, future experience in order to produce stable contribution rates.

Overly conservative or aggressive assumptions will result in actuarial gains or losses each year. When translated into contributions, this will result in decreasing or increasing contribution rates and an inequitable allocation of costs.

The major actuarial assumptions are:
(a) Active service demographic assumptions,
(b) Compensation increase assumptions,
(c) Post-retirement mortality rates,
(d) Interest rate, and
(e) Cost-of-living adjustment rates.

Before presenting our analysis of the System's experience and discussion of the proposed assumptions, it is important to outline considerations that should govern the selection of actuarial assumptions. The recommendations of the American Academy of Actuaries are as follows:
(i) The actuarial assumptions selected should reflect the actuary's best judgement of future events. They should take into account actual experience to the extent possible, but they should also reflect long-term future trends rather than give undue weight to recent past experience.
(ii) The actuary should consider the impact of inflation in selecting the actuarial assumptions to be used.
(iii) The actuary should give consideration to the reasonableness of each actuarial assumption independently as well as the combined impact of all the assumptions.
(iv) The actuary should give careful attention to changes in plan design that may significantly alter expected future experience. For example, a liberalization of early retirement benefits may make advisable a revision in the retirement assumption.
(v) The actuary, in choosing assumptions, should take into account general or specific information available from other sources, including the plan sponsor, plan administrator, investment managers, accountants, economists, etc.

The purpose of this Report is to provide the information necessary to decide on the appropriate assumptions to be used in future valuations. It should be noted that these decisions cannot be made "in a vacuum" but must reflect the present and expected situation within the participating municipalities and the System.

The balance of this Report deals in detail with the various assumptions. In each area, we have made recommendations as to what we believe are appropriate assumptions. These recommendations reflect our "best estimate" of the likely future experience based on:
(a) recent past experience,
(b) general economic views prevailing at this time, and
(c) anticipated trends.

## II. ACTIVE SERVICE DEMOGRAPHIC ASSUMPTIONS

The active service demographic assumptions include rates of:
(a) Termination,
(b) Disability,
(c) Death before retirement, and
(d) Retirement.

Our review of active service demographic assumptions is based on the actuarial valuation data for Groups A, B and C members of the System. Retirement rates for Group D were omitted from the study, as it is relatively new and to date has very few retired members.

The basis for analysis of the System's experience is a comparison of the actual number of separations from service resulting from each of these decrements with those expected based on the assumptions currently in use.

The "expected" values are calculated by applying the various rates or probabilities to the individuals exposed to each respective event. For example, active members under age 55 with less than 5 years of credited service would be exposed to the probabilities of withdrawal, death and disability. A member age 55 with five years of service would be exposed to disability, death and retirement decrements.

Numerical summaries of the System's experience from July 1, 2003, through June 30, 2008, are presented in Appendix I. The tables show the ratios of the actual separations from service resulting from each decrement to those predicted by the present actuarial assumptions. The results are shown separately by assumption and, where appropriate, by gender.

The ratios of actual to expected experience indicate the extent of deviation from the assumptions. A ratio of 1.0 would indicate that experience has been exactly as anticipated.

As an aid to the Trustees in analyzing these results, we have also prepared a series of graphs that present the statistical data summarized in Appendix I in visual form. Our comments will refer to these graphs, which immediately follow each of the following subsections.

## Termination

The graphs that follow present the withdrawal and vesting experience separately for male and female municipal employees. Reviewing the withdrawal and vesting experience, it can be seen that the number of members leaving before retirement eligibility is greater than expected among both males and females
under the present assumptions, especially at lower ages. We also observed that there was a better correlation of termination rates on the basis of length of service, than age.

Accordingly, we recommend that the assumed rates of withdrawal on the basis of age be replaced with the proposed rates based on service set forth in Appendix II.

We recommend the continued use of separate assumptions for males and females. The graphs presented on pages 7 and 8 shows the current rate, the actual rate and the proposed rate separately for males and females.

## Disability and Death

The graphs that follow show the incidence of disability and active service mortality. The financial impact on the funding of the System as the result of this experience is relatively minor. It should be noted that the low incidence of actual deaths and disabilities makes this experience susceptible to rather large fluctuations from year to year.

The present assumed rates of disability produce expected disabilities that are not substantially different than the actual number. We therefore recommend no changes to the disability rates.

Overall active service mortality for both males and females is below that expected on the basis of the current tables, so it is possible to justify a decrease in the assumed death rates applied to active employees. We recommend that the Board consider the adoption of $70 \%$ of the 1995 George B. Buck Mortality Tables for Male and Female Employees for this purpose. This represents a $30 \%$ reduction in the current rates. The proposed rates are set forth in Appendix II. As noted above, because of the small
size of this decrement, the impact of the proposed change on the value of the System's benefits is minimal.

## Active Service Experience - Terminations

July 1, 2003 through June 30, 2008



## Active Service Experience - Terminations

July 1, 2003 through June 30, 2008



Active Service Experience - Disability Retirement July 1, 2003 through June 30, 2008



## Active Service Experience - Deaths

July 1, 2003 through June 30, 2008



## Retirement

The experience with regard to retirement is shown on the following three graphs. Appendix II shows the current and proposed tables of service retirement probabilities. For Groups A, B and C, we are recommending that sex-distinct tables of retirement probabilities be used to refine the prediction of future retirements.

## Group A Employees

In general, at ages below 62, the actual numbers of retirements among Group A employees over the past five years have been greater than the expected numbers of retirements, while at ages 62 and older the actual numbers have been less than expected. We recommend increases in the assumed service retirement rates ages under 62 for both males and females and decreased or constant assumed service retirement rates at ages 62 and older. The sole exception is at age 64 for females, at which we are recommending an increase in the assumed probability of retirement from $20 \%$ to $25 \%$.

## Group B Employees

In general, at ages below 62, the actual numbers of retirements among Group B employees over the past five years have been greater than the expected numbers of retirements, while at ages 62 and older the actual numbers have been less than expected. We recommend increases in the assumed service retirement rates ages under 62 for both males and females and decreases in the service retirement rates at ages 62 through 65 for males and at ages 62 through 69 for females.

## Group C Employees

For males ages 55 through 64, the actual numbers of retirements of retirements among Group C employees over the past five years have generally been greater than the expected numbers of
retirements. We are recommending a combination of increases and decreases in the assumed service retirement rates for male Group C employees at various ages between 55 and 64 .

The actual numbers of retirements among Group C female employees have generally been less than the expected numbers. We are recommending decreases in the assumed service retirement rates for these members at most ages between 55 and 64 .

## Active Service Experience - Group A Service Retirements

July 1, 2003 through June 30, 2008



## Active Service Experience - Group B Service Retirements

 July 1, 2003 through June 30, 2008

## Active Service Experience - Group C Service Retirements

July 1, 2003 through June 30, 2008



## III. POST-RETIREMENT MORTALITY RATES

A review of the statistics with regard to post-retirement mortality for retired members reveals that retired individuals are not living longer than expected. The graphs presented on page 17 show the current rate and the actual rate separately for males and females. The current rates are summarized in Table 8 of Appendix I.

Based on this experience, we recommend that at this time the 1995 Buck Mortality Tables for Males and Females be retained as the post-retirement mortality assumption. Probabilities of death under these tables are shown in Appendix III.

## IV. MEMBERS IN INACTIVE STATUS

In the past, liabilities for members in inactive status have been maintained at $150 \%$ of their accumulated contributions with interest. An examination of the liability ultimately created by participants who ultimately move from inactive status to some other status leads us to recommend that the percentage of contributions with interest used to estimate the liability for these participants be raised from $150 \%$ to 200\%.

Post Retirement Experience - Deaths July 1, 2003 through June 30, 2008



## V. ECONOMIC ASSUMPTIONS

Economic assumptions include:
(a) rates of compensation increase,
(b) investment income, and
(c) post-retirement adjustment in benefits on account of inflation.

## Inflation

The System provides annual cost-of-living adjustments (COLAs). For the Group A, the annual adjustment is equal to one-half of the percentage increase in the CPI-U, but not more than $2 \%$. For Groups B, C and D, the adjustment equals one-half of the percentage increase in the CPI-U, limited to $3 \%$.

With regard to the inflation assumption for COLAs, the U.S. Consumer Price Index (CPI-U) indicates that the inflation rate has averaged slightly above 3\% annually since July 1, 2003.

Other economic data presently available (e.g., recent yields on inflation-indexed bonds, the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters) suggest that the financial markets anticipate a long-term average rate of inflation of about $2.5 \%$ to $3.0 \%$. Current economic assumptions used in the valuation of the System are based on an inflation rate of approximately $3 \%$ per year. We recommend that this assumption be retained.

Currently, we assume a $1.5 \%$ annual adjustment in pensions for Group A and a $1.8 \%$ annual adjustment in pensions for Groups B, C and D. We recommend no changes in these percentages.

## Merit-Promotion Salary Increases

Currently, salaries are assumed to increase at $5.6 \%$ annually. Overall, actual salary increases fell short of this percentage over the five-year period covered by this experience study, rising in the aggregate at the rate of $4.2 \%$ annually in this period. While we do not want to give undue weight to recent past experience, given the long-term nature of this assumption, a reduction in the assumed annual increase from its present level seems warranted in terms of both short- and long-term economic prospects. We recommend a reduction in the salary increase assumption to $5.0 \%$ per year.

If the salary increase experience of the System is analyzed by age or by service group, it is possible to detect some variation from group to group; salaries of younger members and those with relatively small amounts of service tend to rise somewhat faster than those of older and long-serving members. This is consistent with the usual pattern of salary increases over an archetypal worker's career. However, some of the observed pattern is also due to the difficulty that has generally been encountered in the accurate extrapolation of annual rates of pay from data on new entrants, who are typically younger workers. Because the variations among age groups are not significant at ages at which much exposure exists, no adjustment is needed.

## Interest Rate

The estimated total rates of return earned by the VMERS' assets are shown below.

| Year <br> Ending <br> June 30 | Rate of Return <br> Based on Actuarial <br> Asset Value | Rate of Return <br> Based on Market <br> Asset Value |
| :---: | :---: | :---: |
| 2004 | $1.07 \%$ | $12.54 \%$ |
| 2005 | $7.77 \%$ | $7.68 \%$ |
| 2006 | $8.44 \%$ | $10.58 \%$ |
| 2007 | $10.11 \%$ | $15.69 \%$ |
| 2008 | $7.41 \%$ | $-5.66 \%$ |
| $2004-2008$ | $6.91 \%$ | $7.90 \%$ |

The rate of return on the market value of assets has averaged approximately $7.90 \%$ annually during the past five years. With the support of the Board's investment consultant, New England Pension Consultants, we recommend retention of the current assumed interest rate of 8.0\%.

## APPENDIX I

## ACTUAL AND EXPECTED EXPERIENCE

TABLE 1

## COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS FROM ACTIVE SERVICE

TERMINATIONS

| Central <br> Age of <br> Group | Men |  |  | Women |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Actual | Expected | Ratio of Actual To Expected | Actual | Expected | Ratio of Actual To Expected |
| Under 23 | 41 | 18.8 | 2.187 | 68 | 29.9 | 2.276 |
| 25 | 163 | 80.7 | 1.884 | 403 | 175.6 | 2.294 |
| 30 | 152 | 114.6 | 1.212 | 301 | 149.1 | 2.019 |
| 35 | 139 | 130.6 | 1.064 | 289 | 175.9 | 1.643 |
| 40 | 142 | 111.1 | 1.278 | 351 | 198.4 | 1.769 |
| 45 | 156 | 126.6 | 1.233 | 450 | 265.4 | 1.695 |
| 50 | 137 | 113.4 | 1.208 | 349 | 217.0 | 1.608 |
| 55 and over | 167 | 64.8 | 2.577 | 312 | 110.4 | 2.827 |
| Total | 1,097 | 761 | 1.442 | 2,523 | 1,322 | 1.909 |

TABLE 2

COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS FROM ACTIVE SERVICE

DISABILITY RETIREMENTS

| Central <br> Age of <br> Group | Men |  |  | Women |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Actual | Expected | Ratio of Actual To Expected | Actual | Expected | Ratio of Actual To Expected |
| Under 23 | 0 | 0.01 | 0.000 | 0 | 0.02 | 0.000 |
| 25 | 0 | 0.05 | 0.000 | 0 | 0.13 | 0.000 |
| 30 | 0 | 0.10 | 0.000 | 0 | 0.20 | 0.000 |
| 35 | 0 | 0.17 | 0.000 | 0 | 0.57 | 0.000 |
| 40 | 1 | 0.40 | 2.500 | 0 | 1.29 | 0.000 |
| 45 | 1 | 0.82 | 1.220 | 1 | 2.91 | 0.344 |
| 50 | 2 | 1.64 | 1.220 | 3 | 5.05 | 0.594 |
| 55 and over | 5 | 6.47 | 0.773 | 5 | 12.57 | 0.398 |
| Total | 9 | 9.66 | 0.932 | 9 | 22.74 | 0.396 |

TABLE 3
COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS FROM ACTIVE SERVICE

DEATHS

| Central <br> Age of <br> Group | Men |  |  | Women |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Actual | Expected | Ratio of Actual To Expected | Actual | Expected | $\begin{gathered} \hline \text { Ratio of } \\ \text { Actual To } \\ \text { Expected } \\ \hline \end{gathered}$ |
| Under 23 | 0 | 0.08 | 0.000 | 0 | 0.03 | 0.000 |
| 25 | 1 | 0.35 | 2.857 | 0 | 0.17 | 0.000 |
| 30 | 0 | 0.46 | 0.000 | 0 | 0.24 | 0.000 |
| 35 | 2 | 0.68 | 2.941 | 0 | 0.70 | 0.000 |
| 40 | 1 | 1.21 | 0.826 | 0 | 1.41 | 0.000 |
| 45 | 1 | 2.19 | 0.457 | 1 | 3.11 | 0.322 |
| 50 | 3 | 3.69 | 0.813 | 1 | 4.77 | 0.210 |
| 55 | 3 | 5.26 | 0.570 | 3 | 5.76 | 0.521 |
| 60 | 2 | 7.70 | 0.260 | 7 | 6.50 | 1.077 |
| 65 and over | 2 | 7.68 | 0.260 | 4 | 5.64 | 0.709 |
| Total | 15 | 29.30 | 0.512 | 16 | 28.33 | 0.565 |

TABLE 4

## COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS <br> FROM ACTIVE SERVICE

GROUP A SERVICE RETIREMENTS

| Age | Men |  |  | Women |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Actual | Expected | Ratio of Actual To Expected | Actual | Expected | Ratio of Actual To Expected |
| 50 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 51 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 52 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 53 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 54 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 55 | 3 | 1.18 | 2.542 | 15 | 3.74 | 4.011 |
| 56 | 2 | 0.96 | 2.083 | 13 | 3.42 | 3.801 |
| 57 | 5 | 0.98 | 5.102 | 10 | 3.28 | 3.049 |
| 58 | 3 | 1.16 | 2.586 | 12 | 3.58 | 3.352 |
| 59 | 9 | 1.22 | 7.377 | 13 | 3.30 | 3.939 |
| 60 | 7 | 2.75 | 2.545 | 13 | 7.05 | 1.844 |
| 61 | 6 | 2.40 | 2.500 | 10 | 6.05 | 1.653 |
| 62 | 10 | 8.80 | 1.136 | 8 | 20.60 | 0.388 |
| 63 | 5 | 7.00 | 0.714 | 14 | 17.20 | 0.814 |
| 64 | 5 | 6.40 | 0.781 | 20 | 13.60 | 1.471 |
| 65 | 9 | 9.60 | 0.938 | 11 | 20.80 | 0.529 |
| 66 | 3 | 4.25 | 0.706 | 9 | 10.50 | 0.857 |
| 67 | 3 | 3.50 | 0.857 | 5 | 8.00 | 0.625 |
| 68 | 2 | 2.75 | 0.727 | 4 | 4.75 | 0.842 |
| 69 | 0 | 2.00 | 0.000 | 1 | 3.25 | 0.308 |
| 70 and over | 15 | 30.00 | 0.500 | 16 | 59.00 | 0.271 |
| Total | 87 | 84.95 | 1.024 | 174 | 188.12 | 0.925 |

TABLE 5

## COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS <br> FROM ACTIVE SERVICE

GROUP B SERVICE RETIREMENTS

| Age | Men |  |  | Women |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Actual | Expected | Ratio of Actual To Expected | Actual | Expected | Ratio of <br> Actual To <br> Expected |
| 50 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 51 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 52 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 53 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 54 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 55 | 8 | 2.10 | 3.810 | 10 | 3.18 | 3.145 |
| 56 | 6 | 2.32 | 2.586 | 12 | 3.20 | 3.750 |
| 57 | 5 | 2.10 | 2.381 | 11 | 2.94 | 3.741 |
| 58 | 9 | 2.06 | 4.369 | 7 | 2.90 | 2.414 |
| 59 | 6 | 1.92 | 3.125 | 6 | 2.72 | 2.206 |
| 60 | 6 | 4.60 | 1.304 | 9 | 6.10 | 1.475 |
| 61 | 18 | 4.30 | 4.186 | 15 | 5.50 | 2.727 |
| 62 | 24 | 39.50 | 0.608 | 25 | 48.00 | 0.521 |
| 63 | 12 | 14.75 | 0.814 | 14 | 17.75 | 0.789 |
| 64 | 6 | 12.25 | 0.490 | 12 | 15.00 | 0.800 |
| 65 | 17 | 20.00 | 0.850 | 20 | 25.00 | 0.800 |
| 66 | 5 | 7.25 | 0.690 | 4 | 7.75 | 0.516 |
| 67 | 9 | 5.50 | 1.636 | 5 | 5.75 | 0.870 |
| 68 | 3 | 3.25 | 0.923 | 1 | 4.00 | 0.250 |
| 69 | 2 | 2.25 | 0.889 | 2 | 3.50 | 0.571 |
| 70 and over | 9 | 30.00 | 0.300 | 12 | 48.00 | 0.250 |
| Total | 145 | 154.15 | 0.941 | 165 | 201.29 | 0.820 |

TABLE 6

## COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS FROM ACTIVE SERVICE

GROUP C SERVICE RETIREMENTS

| Age | Men |  |  | Women |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Actual | Expected | Ratio of Actual To Expected | Actual | Expected | Ratio of Actual To Expected |
| 50 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 51 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 52 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 53 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 54 | 0 | 0.00 | 0.000 | 0 | 0.00 | 0.000 |
| 55 | 10 | 4.50 | 2.222 | 0 | 1.35 | 0.000 |
| 56 | 2 | 2.30 | 0.870 | 1 | 1.50 | 0.667 |
| 57 | 1 | 1.90 | 0.526 | 0 | 1.70 | 0.000 |
| 58 | 4 | 2.40 | 1.667 | 6 | 2.20 | 2.727 |
| 59 | 4 | 1.90 | 2.105 | 1 | 1.60 | 0.625 |
| 60 | 2 | 2.70 | 0.741 | 0 | 2.40 | 0.000 |
| 61 | 0 | 1.50 | 0.000 | 1 | 1.60 | 0.625 |
| 62 | 7 | 4.00 | 1.750 | 0 | 3.75 | 0.000 |
| 63 | 1 | 2.50 | 0.400 | 4 | 3.25 | 1.231 |
| 64 | 2 | 2.75 | 0.727 | 0 | 2.50 | 0.000 |
| 65 | 3 | 10.00 | 0.300 | 4 | 8.00 | 0.500 |
| 66 | 0 | 6.00 | 0.000 | 1 | 3.00 | 0.333 |
| 67 | 0 | 5.00 | 0.000 | 0 | 1.00 | 0.000 |
| 68 | 0 | 5.00 | 0.000 | 1 | 1.00 | 1.000 |
| 69 | 0 | 3.00 | 0.000 | 0 | 0.00 | 0.000 |
| 70 and over | 1 | 3.00 | 0.333 | 0 | 0.00 | 0.000 |
| Total | 37 | 58.45 | 0.633 | 19 | 34.85 | 0.545 |

## COMPARISON OF ACTUAL AND EXPECTED ANNUAL SALARIES OF MEMBERS

| Age | Annual Salaries (Salaries shown in 1,000s) |  |  |
| :---: | :---: | :---: | :---: |
|  | Actual | Expected | Ratio of Actual To Expected |
| Under 25 | 3,866 | 3,835 | 1.008 |
| 25-29 | 21,002 | 21,402 | 0.981 |
| 30-34 | 32,405 | 32,658 | 0.992 |
| 35-39 | 57,085 | 57,506 | 0.993 |
| 40-44 | 82,536 | 83,749 | 0.986 |
| 45-49 | 113,038 | 114,210 | 0.990 |
| 50-54 | 124,985 | 126,680 | 0.987 |
| 55-59 | 109,029 | 110,621 | 0.986 |
| 60-64 | 79,598 | 80,933 | 0.984 |
| 65 and over | 33,499 | 34,043 | 0.984 |
| Total | 657,043 | 665,637 | 0.987 |

TABLE 8

## SUMMARY OF MORTALITY EXPERIENCE OF PENSIONERS

| Group | Men |  |  | Women |  |  | Total |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Actual | Expected | Ratio of Actual To Expected | Actual | Expected | Ratio of Actual To Expected | Actual | Expected | Ratio of Actual To Expected |
| Service Retirees | 105 | 76.23 | 1.377 | 68 | 62.18 | 1.094 | 173 | 138.41 | 1.250 |
| Disability Retirees | 14 | 7.57 | 1.849 | 11 | 12.11 | 0.908 | 8 | 2.27 | 3.524 |
| Dependants of Deceased Members | 12 | 2.49 | 4.819 | 25 | 7.7 | 3.247 | 37 | 10.19 | 3.631 |
| Total | 131 | 86.29 | 1.518 | 104 | 81.99 | 1.268 | 218 | 150.87 | 1.445 |

## APPENDIX II

## RECOMMENDED ACTIVE SERVICE TABLES

TABLE 1

## RECOMMENDED SEPARATIONS

## FROM ACTIVE SERVICE

## TERMINATIONS

| Central Age <br> of Group | Men | Female |
| :---: | :---: | :---: |
|  | Recommended | Recommended |
| 0 |  |  |
| 1 | $25.0 \%$ | $30.00 \%$ |
| 2 | $18.0 \%$ | $22.00 \%$ |
| 3 | $15.0 \%$ | $18.00 \%$ |
| 4 | $13.5 \%$ | $15.00 \%$ |
| 5 | $12.0 \%$ | $12.00 \%$ |
| 6 | $10.0 \%$ | $10.00 \%$ |
| 7 | $9.0 \%$ | $9.00 \%$ |
| 8 | $8.0 \%$ | $8.00 \%$ |
| 9 | $8.0 \%$ | $6.00 \%$ |
| 10 | $7.0 \%$ | $6.00 \%$ |
|  | $4.0 \%$ | $5.00 \%$ |

TABLE 2

## COMPARISON OF CURRENT AND RECOMMENDED SEPARATIONS FROM ACTIVE SERVICE

GROUP A SERVICE RETIREMENTS

| Central Age <br> of Group | Men |  | Women |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Current | Recommended | Current | Recommended |
|  |  |  |  |  |
| 55 | $2.00 \%$ | $5.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 56 | $2.00 \%$ | $5.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 57 | $2.00 \%$ | $5.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 58 | $2.00 \%$ | $5.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 59 | $2.00 \%$ | $12.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 60 | $5.00 \%$ | $12.00 \%$ | $5.00 \%$ | $7.00 \%$ |
| 61 | $5.00 \%$ | $12.00 \%$ | $5.00 \%$ | $7.00 \%$ |
| 62 | $20.00 \%$ | $20.00 \%$ | $20.00 \%$ | $7.00 \%$ |
| 63 | $20.00 \%$ | $15.00 \%$ | $20.00 \%$ | $15.00 \%$ |
| 64 | $20.00 \%$ | $15.00 \%$ | $20.00 \%$ | $25.00 \%$ |
| 65 | $40.00 \%$ | $40.00 \%$ | $40.00 \%$ | $25.00 \%$ |
| 66 | $25.00 \%$ | $15.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 67 | $25.00 \%$ | $20.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 68 | $25.00 \%$ | $20.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 69 | $25.00 \%$ | $20.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 70 | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ |

TABLE 3

## COMPARISON OF CURRENT AND RECOMMENDED SEPARATIONS <br> FROM ACTIVE SERVICE

GROUP B SERVICE RETIREMENTS

| Central Age <br> of Group | Men |  | Women |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Current | Recommended | Current | Recommended |
|  |  |  |  |  |
| 55 | $2.00 \%$ | $7.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 56 | $2.00 \%$ | $7.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 57 | $2.00 \%$ | $7.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 58 | $2.00 \%$ | $7.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 59 | $2.00 \%$ | $7.00 \%$ | $2.00 \%$ | $7.00 \%$ |
| 60 | $5.00 \%$ | $7.00 \%$ | $5.00 \%$ | $7.00 \%$ |
| 61 | $5.00 \%$ | $20.00 \%$ | $5.00 \%$ | $15.00 \%$ |
| 62 | $50.00 \%$ | $30.00 \%$ | $50.00 \%$ | $25.00 \%$ |
| 63 | $25.00 \%$ | $20.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 64 | $25.00 \%$ | $15.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 65 | $50.00 \%$ | $40.00 \%$ | $50.00 \%$ | $40.00 \%$ |
| 66 | $25.00 \%$ | $25.00 \%$ | $25.00 \%$ | $15.00 \%$ |
| 67 | $25.00 \%$ | $25.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 68 | $25.00 \%$ | $25.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 69 | $25.00 \%$ | $25.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 70 | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ |

TABLE 4

## COMPARISON OF CURRENT AND RECOMMENDED SEPARATIONS FROM ACTIVE SERVICE

GROUP C SERVICE RETIREMENTS

| Central Age <br> of Group | Men |  | Women |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Current | Recommended | Current | Recommended |
|  |  |  |  |  |
| 55 | $15.00 \%$ | $30.00 \%$ | $15.00 \%$ | $0.00 \%$ |
| 56 | $10.00 \%$ | $10.00 \%$ | $10.00 \%$ | $5.00 \%$ |
| 57 | $10.00 \%$ | $5.00 \%$ | $10.00 \%$ | $5.00 \%$ |
| 58 | $10.00 \%$ | $20.00 \%$ | $10.00 \%$ | $25.00 \%$ |
| 59 | $10.00 \%$ | $20.00 \%$ | $10.00 \%$ | $5.00 \%$ |
| 60 | $15.00 \%$ | $10.00 \%$ | $15.00 \%$ | $5.00 \%$ |
| 61 | $10.00 \%$ | $10.00 \%$ | $10.00 \%$ | $5.00 \%$ |
| 62 | $25.00 \%$ | $40.00 \%$ | $25.00 \%$ | $5.00 \%$ |
| 63 | $25.00 \%$ | $10.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 64 | $25.00 \%$ | $20.00 \%$ | $25.00 \%$ | $20.00 \%$ |
| 65 | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ |
| 66 | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ |
| 67 | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ |
| 68 | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ |
| 69 | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ |
| 70 | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ | $100.00 \%$ |

TABLE 5

COMPARISON OF CURRENT AND RECOMMENDED SEPARATIONS FROM ACTIVE SERVICE

DEATHS

| Central Age of Group | Men |  | Women |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Current | Recommended | Current | Recommended |
| 25 | 0.069\% | 0.049\% | 0.018\% | 0.013\% |
| 26 | 0.068\% | 0.048\% | 0.018\% | 0.013\% |
| 27 | 0.067\% | 0.047\% | 0.019\% | 0.013\% |
| 28 | 0.065\% | 0.046\% | 0.020\% | 0.014\% |
| 29 | 0.065\% | 0.045\% | 0.021\% | 0.015\% |
| 30 | 0.065\% | 0.045\% | 0.024\% | 0.017\% |
| 31 | 0.065\% | 0.046\% | 0.027\% | 0.019\% |
| 32 | 0.066\% | 0.046\% | 0.031\% | 0.022\% |
| 33 | 0.068\% | 0.048\% | 0.036\% | 0.025\% |
| 34 | 0.070\% | 0.049\% | 0.040\% | 0.028\% |
| 35 | 0.073\% | 0.051\% | 0.044\% | 0.031\% |
| 36 | 0.076\% | 0.054\% | 0.047\% | 0.033\% |
| 37 | 0.080\% | 0.056\% | 0.050\% | 0.035\% |
| 38 | 0.085\% | 0.060\% | 0.052\% | 0.037\% |
| 39 | 0.090\% | 0.063\% | 0.055\% | 0.038\% |
| 40 | 0.096\% | 0.067\% | 0.058\% | 0.041\% |
| 41 | 0.102\% | 0.072\% | 0.062\% | 0.044\% |
| 42 | 0.109\% | 0.077\% | 0.067\% | 0.047\% |
| 43 | 0.118\% | 0.083\% | 0.074\% | 0.052\% |
| 44 | 0.127\% | 0.089\% | 0.082\% | 0.057\% |
| 45 | 0.138\% | 0.097\% | 0.090\% | 0.063\% |
| 46 | 0.151\% | 0.106\% | 0.099\% | 0.069\% |
| 47 | 0.165\% | 0.115\% | 0.109\% | 0.076\% |
| 48 | 0.180\% | 0.126\% | 0.119\% | 0.083\% |
| 49 | 0.197\% | 0.138\% | 0.131\% | 0.091\% |
| 50 | 0.215\% | 0.150\% | 0.143\% | 0.100\% |
| 51 | 0.235\% | 0.164\% | 0.155\% | 0.109\% |
| 52 | 0.257\% | 0.180\% | 0.169\% | 0.118\% |
| 53 | 0.283\% | 0.198\% | 0.183\% | 0.128\% |
| 54 | 0.312\% | 0.218\% | 0.196\% | 0.138\% |

Current: 1995 Buck Mortality Tables for Males and Females. Recommended: 70\% of 1995 Buck Mortality Tables for Males and Females.

## APPENDIX III

## RECOMMENDED POST-RETIREMENT MORTALITY

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## POST-RETIREMENT MORTALITY RATES

| AGE | MALES | FEMALES | AGE | MALES | FEMALES |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 19 | 0.00064 | 0.00019 | 67 | 0.01590 | 0.00913 |
| 20 | 0.00068 | 0.00019 | 68 | 0.01787 | 0.01062 |
| 21 | 0.00070 | 0.00019 | 69 | 0.02001 | 0.01222 |
| 22 | 0.00071 | 0.00019 | 70 | 0.02233 | 0.01389 |
| 23 | 0.00071 | 0.00019 | 71 | 0.02485 | 0.01562 |
| 24 | 0.00071 | 0.00018 | 72 | 0.02760 | 0.01740 |
| 25 | 0.00070 | 0.00018 | 73 | 0.03062 | 0.01927 |
| 26 | 0.00068 | 0.00018 | 74 | 0.03397 | 0.02124 |
| 27 | 0.00067 | 0.00019 | 75 | 0.03767 | 0.02335 |
| 28 | 0.00066 | 0.00020 | 76 | 0.04176 | 0.02566 |
| 29 | 0.00065 | 0.00021 | 77 | 0.04629 | 0.02821 |
| 30 | 0.00065 | 0.00024 | 78 | 0.05129 | 0.03106 |
| 31 | 0.00065 | 0.00027 | 79 | 0.05678 | 0.03427 |
| 32 | 0.00066 | 0.00031 | 80 | 0.06280 | 0.03789 |
| 33 | 0.00068 | 0.00036 | 81 | 0.06934 | 0.04195 |
| 34 | 0.00070 | 0.00040 | 82 | 0.07634 | 0.04649 |
| 35 | 0.00073 | 0.00044 | 83 | 0.08378 | 0.05152 |
| 36 | 0.00076 | 0.00047 | 84 | 0.09160 | 0.05710 |
| 37 | 0.00080 | 0.00050 | 85 | 0.09971 | 0.06329 |
| 38 | 0.00085 | 0.00052 | 86 | 0.10800 | 0.07012 |
| 39 | 0.00090 | 0.00055 | 87 | 0.11636 | 0.07758 |
| 40 | 0.00096 | 0.00058 | 88 | 0.12474 | 0.08568 |
| 41 | 0.00102 | 0.00062 | 89 | 0.13320 | 0.09425 |
| 42 | 0.00110 | 0.00067 | 90 | 0.14184 | 0.10316 |
| 43 | 0.00118 | 0.00074 | 91 | 0.15083 | 0.11249 |
| 44 | 0.00127 | 0.00082 | 92 | 0.16026 | 0.12230 |
| 45 | 0.00138 | 0.00090 | 93 | 0.17028 | 0.13267 |
| 46 | 0.00151 | 0.00099 | 94 | 0.18102 | 0.14370 |
| 47 | 0.00165 | 0.00109 | 95 | 0.19261 | 0.15548 |
| 48 | 0.00180 | 0.00119 | 96 | 0.20526 | 0.16809 |
| 49 | 0.00197 | 0.00131 | 97 | 0.21918 | 0.18168 |
| 50 | 0.00215 | 0.00143 | 98 | 0.23464 | 0.19640 |
| 51 | 0.00235 | 0.00155 | 99 | 0.25195 | 0.21246 |
| 52 | 0.00257 | 0.00169 | 100 | 0.27147 | 0.23013 |
| 53 | 0.00283 | 0.00183 | 101 | 0.29353 | 0.24979 |
| 54 | 0.00312 | 0.00196 | 102 | 0.31847 | 0.27189 |
| 55 | 0.00346 | 0.00211 | 103 | 0.34656 | 0.29697 |
| 56 | 0.00387 | 0.00226 | 104 | 0.37804 | 0.32556 |
| 57 | 0.00436 | 0.00242 | 105 | 0.41312 | 0.35819 |
| 58 | 0.00495 | 0.00262 | 106 | 0.45193 | 0.39528 |
| 59 | 0.00563 | 0.00287 | 107 | 0.49453 | 0.43713 |
| 60 | 0.00643 | 0.00319 | 108 | 0.54086 | 0.48387 |
| 61 | 0.00735 | 0.00360 | 109 | 0.59071 | 0.53538 |
| 62 | 0.00840 | 0.00413 | 110 | 0.64374 | 0.59129 |
| 63 | 0.00959 | 0.00479 | 111 | 0.69941 | 0.65094 |
| 64 | 0.01094 | 0.00562 | 112 | 0.75705 | 0.71342 |
| 65 | 0.01243 | 0.00661 | 113 | 0.81591 | 0.77769 |
| 66 | 0.01408 | 0.00779 | 114 | 0.87527 | 0.84269 |
|  |  |  | 115 | 1.00000 | 1.00000 |

Basis: 1995 Buck Mortality Tables for Males and Females.

