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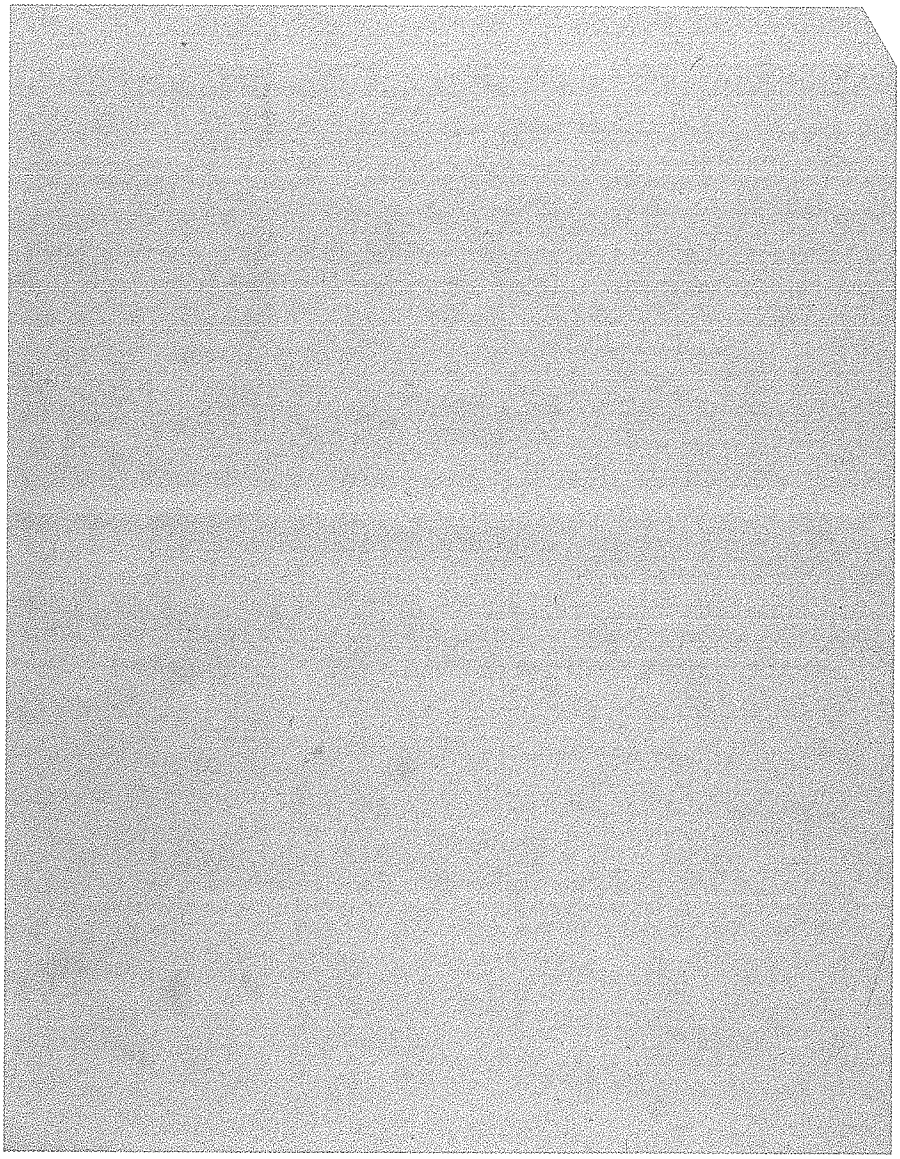
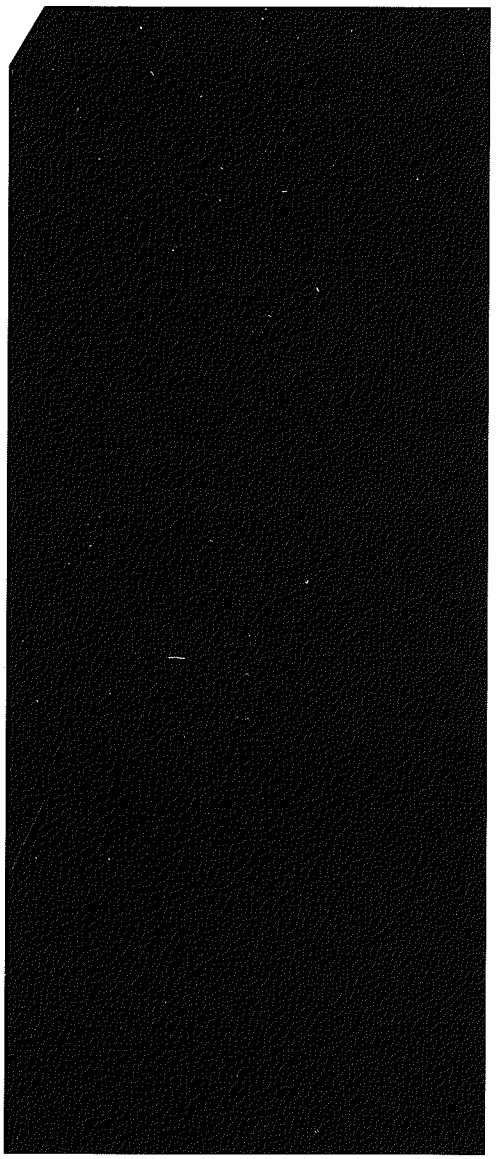
DULUTH TEACHERS' RETIREMENT FUND ASSOCIATION

Actuarial Experience Study for the period July 1, 2002 through June 30, 2006





DULUTH TEACHERS' RETIREMENT FUND ASSOCIATION

Actuarial Experience Study for the period
July 1, 2002 through June 30, 2006

SEGAL

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July 31, 2007

Mr. J. Michael Stoffel
Duluth Teachers' Retirement Fund Association
625 East Central Entrance
Duluth, Minnesota 55811

Dear Mr. Stoffel:

We are pleased to submit this report on the actuarial experience of the Duluth Teachers' Retirement Fund Association for the period July 1, 2002 through June 30, 2006. This investigation is the basis for our recommendation of the assumptions and methods to be used for the July 1, 2007 actuarial valuation. In addition, we recommend a broader, more comprehensive study on the economic assumptions.

All current actuarial assumptions and methods were reviewed as part of this study. Some of our recommendations reflect changes to the assumptions and methods used in the July 1, 2006 actuarial valuation while other current assumptions and methods remain adequate.

Our analysis was conducted in accordance with generally accepted actuarial principles as prescribed by the Actuarial Standards Board (ASB) and the American Academy of Actuaries. Additionally, the development of all assumptions contained herein is in accordance with ASB Actuarial Standard of Practice (ASOP) No. 27 (*Selection of Economic Assumptions for Measuring Pension Obligations*) and ASOP No. 35 (*Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*).

This study has found two areas of concern that require further discussions and analysis under a broader study. First, we believe that the method of amortizing the unfunded accrued liability currently employed may create unstable contribution rates. A separate study should review all available methods and select an amortization method that best matches the long-term nature of the stable benefit promise with a long-term stable contribution rate.

Secondly, the economic assumptions reviewed here (investment return, inflation, salary increases and payroll growth) have been reviewed in an aggregate context, as is the prescribed method for experience studies. Based on the current assumptions, we recommend an "economic forecast" study be performed regarding all economic assumptions.

The undersigned actuaries are experienced with performing experience studies for large public-sector pension plans and are qualified to render the opinions contained in this report.

Sincerely,

Thomas D. Levy, FSA, MAAA, EA
Senior Vice President and Chief Actuary

Andre Latia, FSA, MAAA, EA
Senior Vice President and Consulting Actuary

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TABLE OF CONTENTS

APPENDICES

Actuarial valuations are prepared annually to determine whether the statutory contribution rates are sufficient to fund the Duluth Teachers' Retirement Fund Association ("Association") on an actuarial reserve basis. Each actuarial valuation involves a projection of the benefits expected to be paid in the future to all members of the Association. The projection of expected future benefit payments is based on the characteristics of members as of the valuation date, the benefit provisions in effect on that date ,and assumptions of future events and conditions.

The assumptions used in actuarial valuations can be grouped in two categories: (1) economic assumptions - the assumed long-term rates of investment return, salary increases and payroll growth, and (2) non-economic or demographic assumptions - the assumed rates of withdrawal, disability, retirement, and mortality. Demographic assumptions are ordinarily selected primarily on the basis of recent experience (although a change in plan design or the employment environment may suggest otherwise), while economic assumptions rely more on a long-term perspective of expected future trends.

If actual experience exactly matches the expected experience, the actual annual cost of the Association will equal the annual cost determined by the actuarial valuation. However, this result is virtually never achieved, due to the long-term nature of the benefit projections and the numerous assumptions used in actuarial valuations. The Association recognizes actuarial gains or actuarial losses each year, reflecting the net difference between actual experience and anticipated experience. Determination of the funded status is updated in connection with each actuarial valuation to reflect the net gain or loss. A pattern of gains or losses with respect to one or more assumptions is the basis for recommended changes to the assumptions. Each valuation measures the effectiveness of each assumption and allows for the monitoring of the assumptions.

We are providing to the Association a recommendation of the assumptions and methods to be used in the 2007 actuarial valuation. If the assumptions on an overall basis prove to be a good indicator of actual experience, the actuarially determined contribution rates for the current level of benefits will continue to be sufficient to meet the funding policy of the Association. On the other hand, if the assumptions understate or overstate the actual cost of the Association, the annual contribution rates will vary accordingly.

Actuarial experience studies are undertaken periodically and serve as the basis for recommended changes in actuarial assumptions and methods. A change in assumptions is recommended when it is

demonstrated that the current assumptions do not accurately reflect the current trend determined from analysis of the data or anticipated future trends based upon reasonable expectations. The data analyzed is actual experience for demographic assumptions and economic forecast for economic assumptions. The Actuarial Standards Board (ASB) provides actuaries with standards of practice that provides guidance and recommendations on acceptable methods and techniques to be used in developing both economic and demographic assumptions. Specifically, these are the ASB Actuarial Standard of Practice (ASOP) No. 27 (*Selection of Economic Assumptions for Measuring Pension Obligations*) and ASOP No. 35 (*Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*).

A change in actuarial methodology is recommended when such change adds stability to the actuarial valuation process or provides an approach that better fits the funding policy. The methods considered in this study include the actuarial cost method and the amortization method.

This study reviews the actuarial experience of the Duluth Teachers' Retirement Fund Association for the four-year period from July 1, 2002 through June 30, 2006, compares this experience to the current actuarial assumptions, and recommends changes to the assumptions as necessary. The actuarial methods used in performing the valuation are also reviewed in this study and recommended changes are provided as appropriate.

We recommend changes to the following assumptions or methods:

ECONOMIC ASSUMPTIONS

Inflation The current inflation assumption is 5.00% per annum. We recognize that recent inflation has been lower; hence we recommend further study and modeling with respect to this assumption.

Salary Increase The current salary increase is calculated using the reported salary for the prior fiscal year, with new hires annualized, increased according to the ultimate table shown in the rate table to the current fiscal year and annually for each future year. During a 10-year select period, 0.30% x (10-T), where T is completed years of service, is added to the ultimate rate. When comparing experience against the assumptions, we found that the assumed salary increases are lower than those actually paid during the early years of service and higher for older ages. Therefore, we recommend a change in the select period rates and a decrease in the ultimate rates after age 50.

Payroll Growth The payroll growth assumption is 5.00% per annum and is slightly higher than overall experience of the annual per capita average payroll growth of 4.6% since July 1, 2003. We recommend keeping the current assumption.

DEMOGRAPHIC ASSUMPTIONS

Withdrawal Rates Current withdrawal rates are based on the age and service of the member. During the three-year select period, the rates are 40% for the first year, 10% for the second year, and 6% for the third year for both males and females. Based on experience during the study period, we recommend increasing the three-year period rates to 60% for the first year, 20% for the second year, and 15% for the third year for both males and females. We recommend keeping the current age-based withdrawal rates for the ultimate period.

Disability Incidence Rates Disability incidence rates are currently age-related, ending at age 64. We recommend keeping the current assumptions.

Retirement Rates The study indicates that actual retirement rates are lower than the current assumed rates for participants eligible to retire under the Old Plan. On the other hand, actual retirement rates are higher than the current assumed rates for participants eligible to retire under the New Plan. We recommend that one set of retirement rates cover participants eligible under both the Old Plan and New Plan to better reflect anticipated future plan experience. Therefore, we recommend the "Rule of 90" rates for all members remain at 40.00% for ages through 66, then 100% for ages 67 and later. Also, we recommend the "all other retirements" rates for all members use the current Old Plan assumptions through age 66, then 100% for ages 67 and later.

Post-Retirement Mortality We recommend the current mortality table, the 1983 Group Annuity Mortality Table set back two years for males and no set back for females, be changed to the 1994 Group Annuity Mortality Table set back two years for both males and females.

Pre-Retirement Mortality We recommend the current mortality table, the 1983 Group Annuity Mortality Table set back 10 years for males and set back seven years for females, be changed to the 1994 Group Annuity Mortality Table set back two years for both males and females.

Disabled Mortality We recommend the current mortality table, the 1977 Railroad Retirement Board Mortality Table for Disabled Lives, be updated to the rates for the disabled mortality table described under the Disabled Eligible for Social Security disability – ERISA Section 4044 for 2006 valuation dates (SS 2006) for both males and females for ages through 54. For ages 55 to 64, graded rates between the SS 2006 rates and the healthy post-retirement mortality table (1994 Group Annuity Mortality table set back two years for males and females) were developed. For ages 65 and later, the healthy post-retirement mortality table (1994 Group Annuity Mortality Table set back two years for males and females) is used.

The economic assumptions have a significant impact on the development of plan liabilities. Changes to these assumptions can substantially alter the results determined by the actuary. The goal of our analysis is to produce a consistent set of economic assumptions that appropriately reflect expected future economic trends.

The primary economic assumptions that affect the Association's funding are:

- Investment return
- Salary increases
- Payroll growth
- Inflation

The current economic assumptions used for the July 1, 2006 actuarial valuation for the Duluth Teachers' Retirement Fund Association are as follows:

Investment return	-	Pre-retirement: 8.50% per annum Post-retirement: 6.50% per annum
Salary increases	-	Reported salary for prior fiscal year, with new hires annualized, increased according to the ultimate table shown in the rate table to current fiscal year and annually for each future year. During a 10-year select period, 0.30% x (10-T) where T is completed years of service is added to the ultimate rate.
Payroll growth	-	5.00% per annum
Inflation	-	5.00% per annum

The Actuarial Standards Board (ASB) has adopted Actuarial Standard of Practice No. 27 (ASOP 27), (Selection of Economic Assumptions for Measuring Pension Obligations) to provide actuaries guidance in developing economic assumptions. A key feature of the ASB's guidance is the "building block" approach to developing economic assumptions. This approach requires the actuary to consider the key component parts of major assumptions and determine reasonable best estimates for each component.

Under this approach, we consider the investment rate of return assumption as the combination of an inflation component and a real rate of return component. The components of the salary increase assumption are inflation, productivity and merit. The inflation component is included in all economic assumptions, and therefore is key to developing a consistent set of actuarial assumptions.

A. Inflation

In reviewing the assumed inflation component, we referred to commonly referenced historical measures of inflation, the "Minneapolis-St. Paul, MN-WI" and "National" Consumer Price Indexes for all urban consumers (CPI-U). The table below shows how recent inflation experience is well below the longer-term average rate.

Average Annual Change

	Minneapolis – St. Paul, MN-WI	CPI-U
Past 5 Years	2.16%	2.65%
Past 10 Years	2.61%	2.62%
Past 20 Years	2.99%	3.13%

The average annual rate of increase in the CPI-U over the five years ending June 30, 2006 is 2.65%. Historical trend is a less important consideration for the assumed rate of inflation, but assists in determining the reasonable bounds of expected inflation.

The typical range of expected inflation for actuarial assumptions in recent years is between 3.00% and 4.50%. Considering this trend, we have determined the current reasonable range to be between 2.75% and 3.50%.

As a check of the validity of this reasonable range, we reference the *2006 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds (2006 OASDI Trustees Report).* The range of inflation rates in this report was 1.80% for the low-cost projection and 3.80% for the high-cost projection.

The current inflation assumption is 5.00% per annum. We recommend that this be reviewed in the broader study to take into account risk factors such as recent economic developments, changing work force demographics, as well as using the past as a marker for reasonableness.

B. Investment Rate of Return

The investment rate of return assumption is developed using the "building block" approach as outlined in ASOP 27. Under this approach, the investment return assumption is made up of two components: the inflation component and the real investment rate of return component. The reasonable range of the inflation component determined on the previous page is combined with the reasonable range of the real rate of return component. This reasonable range is then evaluated and refined. The final recommendation is a specific point in this best-estimate range.

In developing the reasonable range for the real rate of return, we consider the historical returns of the Association's two major asset classes, stocks and bonds. First, over the long term, U.S. stocks (S&P 500) have averaged an annual rate of return of 10.20%, while U.S. bonds have averaged a 5.70% annual rate of return according to Ibbotson Associates' historical market data. Adjusting for the average annual rate of inflation since 1926 of 3.10%, and considering the range of common allocations (35% to 65% for both stocks and bonds), we determined the initial range for the total expected real rate of return to be 4.20% to 5.50% for a similarly diversified portfolio. Assuming a reasonable range of inflation assumption between 2.75% and 3.50%, the total normal expected investment return would range from 6.95% to 9.00%. Then with an allowance for investment expense of 0.50%, the range estimate for the investment rate of return assumption is 6.45% to 8.50%.

These real rates of return and rates of inflation have been developed without further modeling of demographic risks to the plan (which may or may not play a role in changing asset allocations or return assumptions). This range development should be viewed as only a single point in the more broad study of long-term economic forecasts.

The current assumption is 8.50%, which is at the high end of the range developed for this assumption. The 8.50% appears optimistic, and we recommend a comprehensive review of all investment assumptions in the aggregate.

C. Salary Increase Assumption

Under the "building block" approach recommended in ASOP 27, this assumption is composed of three components; inflation, productivity, and merit/promotion. The inflation and productivity components are combined to produce the assumed rate of wage inflation. This rate represents the "across the board" average annual increase in salaries shown in the experience data. The merit component includes the additional increases in salary due to performance, seniority, promotions, etc.

This component is typically more correlated to years of service than age, especially at lower years of service. Thus, we recommend the continued use of a select and ultimate salary scale. The current annual salary increase assumptions under the ultimate rates are shown at the following ages:

Age	Rate
20	6.90%
25	6.75%
30	6.50%
35	6.25%
40	6.00%
45	5.50%
50	5.00%
55	5.00%
60	5.00%
65	5.00%

During the first 10 years of employment, referred to as the select period, an amount equal to 0.30% times (10 – T), where T is completed years of service, is added to the ultimate rate.

The determination of the reasonable range for the productivity component considers the historical experience of the workforce, as well as national indicators of productivity growth.

C. Salary Increase Assumption (continued)

Below is a summary of the observed and assumed average annual increase during the 10-year select period.

Service	Observed Average Annual Increase	Assumed Average Annual Increase	Recommended Average Annual Increase
1 – 2	9.30%	8.33%	8.00%
2 – 3	9.37%	7.98%	8.00%
3 – 4	10.23%	7.70%	8.00%
4 – 5	10.44%	7.34%	8.00%
5 – 6	9.01%	7.05%	8.00%
6 – 7	13.07%	6.64%	8.00%
7 – 8	6.39%	6.27%	7.26%
8 – 9	4.68%	5.92%	6.52%
Ultimate	3.82%	5.20%	4.95%

Below is a summary of the observed and assumed average annual increases for all participants during both the select and ultimate periods.

Age Group	Observed Average Annual Increase	Assumed Average Annual Increase	Recommended Average Annual Increase
20 – 25	8.75%	8.13%	8.00%
25 – 30	12.06%	8.54%	8.00%
30 – 35	9.39%	7.37%	7.45%
35 – 40	7.18%	7.01%	7.16%
40 – 45	5.52%	5.93%	6.17%
45 – 50	4.54%	5.66%	5.97%
50 – 55	4.55%	5.15%	5.13%
55 – 60	3.48%	5.12%	4.70%
60 – 65	3.38%	5.11%	4.42%
65 – 70	3.42%	5.05%	3.87%

C. Salary Increase Assumption (continued)

The observed data on the prior page reflects higher salary increases actually paid during the early years of service, both in the select period (through approximately seven years of service) and the ultimate period (for ages before 40). Hence, we recommend a change to the current select period rates to 8.00% for all year of service through service year 6–7, then 7.25% for service year 7–8, 6.50% for service year 8–9, then the ultimate for all future years. Also, we recommend continuing the decreasing pattern of the ultimate rates for ages after 50 of 0.1% through age 64, then an ultimate rate of 3.50% for ages 65 and later.

The complete table of recommended rates is shown in Appendix B.

D. Payroll Growth Assumption

Unlike the other economic assumptions, the payroll growth assumption plays no part in the calculation of the Association's liabilities. It does, however, have a material impact upon the determination of the amortization of the unfunded actuarial accrued liability and the determination of contribution rates. Under the current funding method, the amortization of the unfunded actuarial accrued liability over the funding period is calculated to be level as a percent of payroll. This calculation requires an assumption of the future annual increase in total covered payroll over the funding period.

The average annual increase of the Association's active per capita member payroll is 4.6% annually since July 1, 2003. The average annual decrease in the number of active members is 5.1% per year since July 1, 2003. This experience study shows that historically the payroll growth experience has been close to assumed, hence we recommend continued use of the 5.00% payroll growth assumption.

Current payroll growth assumption – 5.00% per annum
Recommended payroll growth assumption – 5.00% per annum

The assumptions discussed in this section are demographic in nature, and rely heavily on the experience data and its credibility. The actuary often uses professional judgment in applying a level of credibility to experience data.

A primary analysis tool used in measuring the effectiveness of demographic assumptions is the actual to-expected ratio, or A/E ratio. This ratio is the number of actual occurrences divided by the assumed (expected) number of occurrences. An A/E ratio greater than 100% results from more actual occurrences than assumed, and an A/E ratio less than 100% results from fewer actual occurrences than assumed. An A/E ratio of 100% is not always the most desired result. For example, the trend of decreasing mortality rates is well documented; therefore the recommended mortality assumption should reflect the current mortality rates from the data with a margin to appropriately account for the expected trend of mortality improvement. Thus, an A/E ratio greater than 100% is typically desired for the recommended mortality assumption.

A. Withdrawal Rates

The withdrawal rates used in actuarial valuations project the percentage of employees who are expected to terminate employment each year before the first assumed retirement age.

Current Actuarial Assumptions

The current assumption utilizes a "select and ultimate" approach. The select rates are used to reflect the consistency of withdrawal rates among employees with the same years of service regardless of their age. After the three-year select period, age-related rates are used to approximate the employees' withdrawal rates.

A. Withdrawal Rates (continued)

The select withdrawal rates used for the July 1, 2006 actuarial valuation for the first three years of service are shown below:

Service	Male	Female
0 - 1	40.00%	40.00%
1 - 2	10.00%	10.00%
2 - 3	6.00%	6.00%

The ultimate withdrawal rates used for the July 1, 2006 actuarial valuation are shown below for certain ages:

Age	Male	Female
20	3.50%	3.50%
25	3.25%	3.25%
30	3.00%	3.00%
35	2.75%	2.75%
40	2.50%	2.50%
45	2.00%	2.00%
50	1.50%	1.50%
55	0.75%	0.75%

Membership Experience

A member withdraws from active employment when a termination from employment occurs prior to attaining the eligibility requirement for a retirement benefit. The current assumption utilizes an approach that accounts for a change in withdrawal rates at varying ages of employees with more than three years of service. It is reflected in the experience data that the change in these rates is better correlated to the change in years of service. It is apparent that, after a certain "select" period, the rates of withdrawal for employees vary within a small range, which can be approximated with a single "ultimate" rate.

A. Withdrawal Rates (continued)

The tables below summarize the total number of withdrawals during the select period, the actual average number per year and the expected average number per year based on the assumed withdrawal rates for male and female participants.

Male

	Number of Withdrawals Fiscal Year Ended June 30				Average Per Year		
Years of Service	2003	2004	2005	2006	Actual	Expected	Ratio
0 – 1	22	40	22	20	26	13	2.00
1 – 2	1	6	1	0	2	1	2.00
2 – 3	3	3	3	0	2	0	0.00
Total	**26**	**49**	**26**	**20**	**30**	**14**	**2.14**

Female

	Number of Withdrawals Fiscal Year Ended June 30				Average Per Year		
Years of Service	2003	2004	2005	2006	Actual	Expected	Ratio
0 – 1	74	125	57	46	76	40	1.90
1 – 2	7	21	4	5	9	2	4.50
2 – 3	6	19	3	0	7	1	7.00
Total	**87**	**165**	**64**	**51**	**92**	**43**	**2.14**

A. Withdrawal Rates (continued)

The tables below summarize the actual, expected, and recommended select withdrawal rates for male and female participants:

Male

Years of Service	Actual	Expected	Ratio	Recommended
0 – 1	77.45%	40.00%	2.00	60.00%
1 – 2	32.80%	10.00%	2.00	20.00%
2 – 3	41.09%	6.00%	0.00	15.00%

Female

Years of Service	Actual	Expected	Ratio	Recommended
0 – 1	74.82%	40.00%	1.90	60.00%
1 – 2	37.31%	10.00%	4.50	20.00%
2 – 3	35.28%	6.00%	7.00	15.00%

A. Withdrawal Rates (continued)

The tables below summarize the total number of withdrawals during the ultimate period, the actual average number per year and the expected average number per year based on the assumed withdrawal rates for male and female participants.

Male

Age Group	Number of Withdrawals Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
25-30	0	0	0	0	0	0	0.00
30-35	0	5	0	0	1	1	1.00
35-40	0	1	1	1	1	1	1.00
40-45	0	0	0	0	0	1	0.00
45-50	0	3	0	0	1	1	1.00
50-55	0	3	1	2	2	1	2.00
Total	**0**	**12**	**2**	**3**	**5**	**5**	**1.00**

Female

Age Group	Number of Withdrawals Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
25-30	0	4	0	0	1	0	0.00
30-35	0	5	1	1	2	1	2.00
35-40	1	5	3	1	3	1	3.00
40-45	2	8	1	1	3	2	1.50
45-50	2	10	1	0	3	2	1.50
50-55	5	6	0	1	3	2	1.50
Total	**10**	**38**	**6**	**4**	**15**	**8**	**1.88**

A. Withdrawal Rates (continued)

The tables below summarize the actual, expected, and recommended ultimate withdrawal rates for male and female participants.

Male

Age Group	Actual	Expected	Ratio	Recommended
25-30	0.00%	3.09%	0.00	3.09%
30-35	5.88%	2.90%	1.00	2.90%
35-40	2.36%	2.64%	1.00	2.64%
40-45	0.00%	2.28%	0.00	2.28%
45-50	1.86%	1.78%	1.00	1.78%
50-55	2.39%	1.17%	2.00	1.17%

Female

Age Group	Actual	Expected	Ratio	Recommended
25-30	7.27%	3.08%	0.00	3.08%
30-35	3.55%	2.90%	2.00	2.90%
35-40	4.48%	2.64%	3.00	2.64%
40-45	3.60%	2.28%	1.50	2.28%
45-50	2.56%	1.77%	1.50	1.77%
50-55	1.47%	1.18%	1.50	1.18%

A. Withdrawal Rates (continued)

Findings and Recommendations

We recommend the withdrawal assumption continue to utilize a select and ultimate approach.

The data reflects the actual withdrawal rates in the ultimate period very well. Therefore, we recommend the continued use of the current assumed rates in the ultimate period. For the select period, the data reflected higher–than-expected withdrawal rates. We recommend increasing the withdrawal rates during the select period to 60.00% for the first year, 20.00% for the second year and 15.00% for the third year for both males and females, to better reflect experience.

The complete tables of recommended withdrawal rates are shown in Appendix C.

The actual/expected ratio of the recommended assumptions are as follows:

Select Period:

Male:	131.1%
Female:	129.4%

Ultimate Period:

Male:	118.4%
Female:	146.8%

B. Disability Incidence Rates

The rates of disability used in actuarial valuations project the percentage of employees who are expected to become disabled each year.

Current Actuarial Assumptions

The disability incidence rates used for the July 1, 2006 actuarial valuation are shown below for certain ages:

Age	Male	Female
35	0.01%	0.01%
40	0.03%	0.03%
45	0.06%	0.06%
50	0.10%	0.10%
55	0.15%	0.15%
60	0.21%	0.21%

B. Disability Incidence Rates (continued)

The tables below summarize the total number of disabilities in each age group, the actual average number and the expected average number based on the assumed disability incidence rates for male and female participants.

Male

Age Group	Number of Disabilities Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
20-25	0	0	0	0	0	0	0.00
25-30	0	0	0	0	0	0	0.00
30-35	0	0	0	0	0	0	0.00
35-40	0	0	0	0	0	0	0.00
40-45	0	0	0	0	0	0	0.00
45-50	0	0	0	0	0	0	0.00
50-55	0	0	0	0	0	0	0.00
55-60	0	0	1	0	0	0	0.00
60-65	0	0	0	0	0	0	0.00
Total	**0**	**0**	**1**	**0**	**0**	**0**	**0.00**

Female

Age Group	Number of Disabilities Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
20-25	0	0	0	0	0	0	0.00
25-30	0	0	0	0	0	0	0.00
30-35	0	0	0	0	0	0	0.00
35-40	0	0	0	0	0	0	0.00
40-45	0	0	0	0	0	0	0.00
45-50	0	0	1	0	0	0	0.00
50-55	0	0	0	0	0	0	0.00
55-60	0	0	0	1	0	0	0.00
60-65	0	0	0	0	0	0	0.00
Total	**0**	**0**	**1**	**1**	**1**	**1**	**1.00**

B. Disability Incidence Rates (continued)

The tables summarize the actual, expected, and recommended disability incidence rates for male and female participants.

Male

Age Group	Actual	Expected	Ratio	Recommended
20-25	0.00%	0.00%	0.00	0.00%
25-30	0.00%	0.00%	0.00	0.00%
30-35	0.00%	0.00%	0.00	0.00%
35-40	0.00%	0.01%	0.00	0.01%
40-45	0.00%	0.03%	0.00	0.03%
45-50	0.00%	0.06%	0.00	0.06%
50-55	0.00%	0.10%	0.00	0.10%
55-60	0.37%	0.15%	0.00	0.15%
60-65	0.00%	0.21%	0.00	0.21%

Female

Age Group	Actual	Expected	Ratio	Recommended
20-25	0.00%	0.00%	0.00	0.00%
25-30	0.00%	0.00%	0.00	0.00%
30-35	0.00%	0.00%	0.00	0.00%
35-40	0.00%	0.01%	0.00	0.01%
40-45	0.00%	0.03%	0.00	0.03%
45-50	0.16%	0.06%	0.00	0.06%
50-55	0.00%	0.10%	0.00	0.10%
55-60	0.19%	0.15%	0.00	0.15%
60-65	0.00%	0.21%	0.00	0.21%

B. Disability Incidence Rates (continued)

Findings and Recommendations

For active employees, actual experience shows disability incidence occurs as expected for both males and females. Taking into account the limited occurrence of disability over the period observed, the difference between actual and expected is not enough to warrant making any changes to the assumption. We therefore recommend no change to the current disability incidence assumption.

The complete table of recommended disability incidence rates is shown in Appendix D.

C. Retirement Rates

The rates of retirement used in actuarial valuations project the percentage of employees who are expected to retire each year.

Current Actuarial Assumptions

The retirement rates used for the July 1, 2006 actuarial valuation are shown below:

Age	Rule of 90 Eligible	All Other Retirements (Old Plan)	All Other Retirements (New Plan)
55	40%	15%	10%
56	40%	15%	10%
57	40%	15%	10%
58	40%	15%	10%
59	40%	15%	10%
60	40%	15%	10%
61	40%	40%	20%
62	40%	40%	20%
63	40%	40%	20%
64	40%	40%	20%
65	40%	40%	20%
66	40%	50%	40%
67	40%	50%	40%
68	40%	50%	40%
69	40%	50%	40%
70	40%	50%	40%
71	40%	80%	80%
72	40%	80%	80%
73	40%	80%	80%
74	40%	80%	80%
75	40%	80%	80%
76	40%	80%	80%
77	40%	80%	80%
78	40%	80%	80%
79	40%	80%	80%
80 & Over	100%	100%	100%

C. Retirement Rates (continued)

The tables below and on the next page summarize the total number of retirements at each age, the actual average number and the expected average number based on the assumed retirement rates.

Rule of 90 Eligible (Old Plan)

Age	Number of Retirements Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
55	0	0	0	0	0	0	0.00
56	0	0	0	0	0	0	0.00
57	2	1	0	0	1	1	1.00
58	0	1	0	0	0	1	0.00
59	0	1	0	0	0	2	0.00
60	0	-	0	0	0	1	0.00
61	0	2	0	0	1	1	1.00
62	0	0	0	0	0	0	0.00
63	0	0	0	0	0	0	0.00
64	0	0	0	0	0	0	0.00
65	0	0	0	0	0	0	0.00
66	0	0	0	0	0	0	0.00
67	0	0	0	0	0	0	0.00
68	0	0	0	0	0	0	0.00
69	0	0	0	0	0	0	0.00
70	0	0	0	0	0	0	0.00
Over 70	0	0	0	0	0	0	0.00
Total	**2**	**5**	**0**	**0**	**2**	**6**	**0.33**

C. Retirement Rates (continued)

Rule of 90 Eligible (New Plan)

Age	Number of Retirements Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
55	0	0	0	0	0	0	0.00
56	0	0	1	0	0	0	0.00
57	0	0	1	0	0	0	0.00
58	0	0	1	0	0	0	0.00
59	0	0	0	2	1	0	0.00
60	0	0	2	1	1	0	0.00
61	0	0	2	1	1	0	0.00
62	0	0	0	1	0	0	0.00
63	0	0	0	0	0	0	0.00
64	0	0	0	0	0	0	0.00
65	0	0	0	0	0	0	0.00
66	0	0	0	0	0	0	0.00
67	0	0	0	1	0	0	0.00
68	0	0	0	0	0	0	0.00
69	0	0	0	0	0	0	0.00
70	0	0	0	0	0	0	0.00
Over 70	0	0	0	0	0	0	0.00
Total	**0**	**0**	**7**	**6**	**3**	**0**	**0.00**

C. Retirement Rates (continued)

All Other Retirements (Old Plan)

Age	Number of Retirements Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
55	4	2	2	3	3	4	0.75
56	4	7	1	0	3	4	0.75
57	4	4	3	0	3	2	1.50
58	3	2	1	0	2	2	1.00
59	3	2	0	1	2	1	2.00
60	2	1	0	0	1	1	1.00
61	4	0	0	0	1	1	1.00
62	1	0	0	3	1	1	1.00
63	0	0	0	0	0	0	0.00
64	1	1	0	0	1	1	1.00
65	0	0	0	0	0	0	0.00
66	0	0	0	0	0	0	0.00
67	0	0	0	0	0	0	0.00
68	0	0	0	0	0	0	0.00
69	0	0	0	0	0	0	0.00
70	0	0	0	0	0	0	0.00
Over 70	0	0	0	0	0	0	0.00
Total	**26**	**19**	**7**	**7**	**17**	**17**	**1.00**

C. Retirement Rates (continued)

All Other Retirements (New Plan)

Age	Number of Retirements Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
55	4	1	2	4	3	3	1.00
56	1	1	4	7	3	2	1.50
57	0	0	7	4	3	1	3.00
58	1	0	5	3	2	1	2.00
59	0	1	2	1	1	1	1.00
60	1	0	1	2	1	1	1.00
61	2	0	1	4	2	1	2.00
62	0	2	1	1	1	1	1.00
63	0	1	1	0	1	0	0.00
64	0	1	0	1	1	0	0.00
65	0	0	0	1	0	0	0.00
66	0	0	0	0	0	0	0.00
67	0	0	0	0	0	0	0.00
68	0	0	0	0	0	0	0.00
69	0	0	0	0	0	0	0.00
70	0	0	0	0	0	0	0.00
Over 70	0	0	0	0	0	0	0.00
Total	**9**	**7**	**24**	**28**	**18**	**11**	**1.64**

C. Retirement Rates (continued)

The tables below and on the next page summarize the actual, expected, and recommended retirement rates.

Rule of 90 Eligible

Age Group	Old Plan Average Actual	Old Plan Average Expected	Old Plan Ratio	New Plan Average Actual	New Plan Average Expected	New Plan Ratio	Recommended All Members
55	0.00%	40.00%	0.00	0.00%	40.00%	0.00	40.00%
56	0.00%	40.00%	0.00	100.00%	40.00%	0.00	40.00%
57	33.33%	40.00%	1.00	100.00%	40.00%	0.00	40.00%
58	7.69%	40.00%	0.00	100.00%	40.00%	0.00	40.00%
59	6.25%	40.00%	0.00	100.00%	40.00%	0.00	40.00%
60	0.00%	40.00%	0.00	100.00%	40.00%	0.00	40.00%
61	22.22%	40.00%	1.00	100.00%	40.00%	0.00	40.00%
62	0.00%	40.00%	0.00	100.00%	40.00%	0.00	40.00%
63	0.00%	40.00%	0.00	0.00%	40.00%	0.00	40.00%
64	0.00%	40.00%	0.00	0.00%	40.00%	0.00	40.00%
65	0.00%	40.00%	0.00	0.00%	40.00%	0.00	40.00%
66	0.00%	40.00%	0.00	0.00%	40.00%	0.00	40.00%
67	0.00%	40.00%	0.00	100.00%	40.00%	0.00	100.00%
68	0.00%	40.00%	0.00	0.00%	40.00%	0.00	100.00%
69	0.00%	40.00%	0.00	0.00%	40.00%	0.00	100.00%
70-79	0.00%	40.00%	0.00	0.00%	40.00%	0.00	100.00%
80 & over	0.00%	100.00%	0.00	0.00%	100.00%	0.00	100.00%

C. Retirement Rates (continued)

All Other Retirements

Age Group	Old Plan Average Actual	Old Plan Average Expected	Old Plan Average Ratio	New Plan Average Actual	New Plan Average Expected	New Plan Average Ratio	Recommended All Members
55	5.56%	15.00%	0.75	7.14%	10.00%	1.00	15.00%
56	12.50%	15.00%	0.75	14.29%	10.00%	1.50	15.00%
57	18.33%	15.00%	1.50	18.64%	10.00%	3.00	15.00%
58	14.63%	15.00%	1.00	18.00%	10.00%	2.00	15.00%
59	22.22%	15.00%	2.00	11.43%	10.00%	1.00	15.00%
60	15.79%	15.00%	1.00	16.00%	10.00%	1.00	15.00%
61	30.77%	40.00%	1.00	30.43%	20.00%	2.00	40.00%
62	50.00%	40.00%	1.00	36.36%	20.00%	1.00	40.00%
63	0.00%	40.00%	0.00	25.00%	20.00%	0.00	40.00%
64	33.33%	40.00%	1.00	40.00%	20.00%	0.00	40.00%
65	0.00%	40.00%	0.00	20.00%	20.00%	0.00	40.00%
66	0.00%	50.00%	0.00	0.00%	40.00%	0.00	50.00%
67	0.00%	50.00%	0.00	0.00%	40.00%	0.00	100.00%
68	0.00%	50.00%	0.00	0.00%	40.00%	0.00	100.00%
69	0.00%	50.00%	0.00	0.00%	40.00%	0.00	100.00%
70	0.00%	50.00%	0.00	0.00%	40.00%	0.00	100.00%
71-79	0.00%	80.00%	0.00	0.00%	80.00%	0.00	100.00%
80 & over	0.00%	100.00%	0.00	0.00%	100.00%	0.00	100.00%

C. Retirement Rates (continued)

Findings and Recommendations

For active employees, actual experience shows less retirement than expected under the Rule of 90 provision for Old Plan members and more retirement than expected under the Rule of 90 provision for New Plan members. The actual retirement under the All Other Retirement provision for Old Plan members was equal to expected, and for New Plan members, the actual retirement under the All Other Retirement provisions was higher than expected.

We recommend a change in the Rule of 90 retirement rates, to 100% retirement at age 67 for all members. Also, we recommend changing the All Other Retirement rates to equal the current Old Plan rates for all members through age 66, with a 100% retirement rate at age 67 to better reflect experience.

These assumption changes do not explicitly take into account the Combined Service Annuity (CSA) provisions. It is unclear to what extent the rates of retirement are affected by the CSA provisions. We recommend that the effects of the CSA on retirement ages and liabilities be studied further.

The complete table of recommended retirement rates is shown in Appendix E.

The actual/expected ratios of the recommended assumptions are as follows:

Rule of 90 Retirement:	58.48%
All Other Retirement:	79.34%

D. Mortality Rates – Post-Retirement

The post-retirement mortality rates used in actuarial valuations project the percentage of beneficiaries and non-disabled retirees who are expected to die in the upcoming year.

Current Actuarial Assumptions

The mortality table for male beneficiaries and non-disabled retirees used for the 2006 actuarial valuation is the 1983 Group Annuity Mortality (GAM) Table for males, set back two years. The mortality table for female beneficiaries and non-disabled retirees is the 1983 Group Annuity Mortality (GAM) Table for females. The mortality rates are shown below for certain ages:

Mortality Rates

Age	Male	Female
50	0.31%	0.16%
55	0.52%	0.25%
60	0.77%	0.42%
65	1.24%	0.71%
70	2.22%	1.24%
75	3.67%	2.40%
80	6.07%	4.29%
85	9.75%	6.99%
90	14.41%	11.18%
95	20.30%	18.24%

D. Mortality Rates – Post-Retirement (continued)

The tables below and on the next page summarize the total number of deaths in each age group, the actual average number and the expected average number based on the assumed mortality rates for male and female participants.

Male

Age Group	Number of Deaths Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
55-60	0	0	1	0	0	0	0.00
60-65	0	1	1	1	1	1	1.00
65-70	1	1	1	2	1	2	0.50
70-75	2	2	1	3	2	3	0.67
75-80	1	1	5	1	2	3	0.67
80-85	1	0	2	2	1	3	0.33
85-90	1	7	3	0	3	1	3.00
90-95	2	0	1	1	1	1	1.00
95-100	1	1	1	0	1	0	0.00
100-105	3	0	0	0	1	0	0.00
105-110	0	0	0	0	0	0	0.00
Total	**12**	**13**	**16**	**10**	**13**	**14**	**0.93**

D. Mortality Rates – Post-Retirement (continued)

Female

Age Group	Number of Deaths Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
55-60	0	0	2	0	1	0	0.00
60-65	0	0	0	0	0	1	0.00
65-70	0	0	0	1	0	1	0.00
70-75	1	2	3	1	2	2	1.00
75-80	0	0	2	1	1	3	0.33
80-85	3	1	1	2	2	3	0.67
85-90	1	3	8	6	5	3	1.67
90-95	2	3	7	4	4	3	1.33
95-100	2	2	3	3	3	2	1.50
100-105	2	2	3	0	2	1	2.00
105-110	0	0	1	0	0	0	0.00
Total	**11**	**13**	**30**	**18**	**20**	**19**	**1.05**

D. Mortality Rates – Post-Retirement (continued)

The tables below and on the next page summarize the actual, expected and recommended post-retirement mortality rates for male and female participants for selected ages.

Male

Age Group	Actual	Expected	Ratio	Recommended
55-60	0.48%	0.64%	0.00	0.48%
60-65	0.70%	0.92%	1.00	0.81%
65-70	1.27%	1.60%	0.50	1.47%
70-75	2.05%	2.73%	0.67	2.37%
75-80	2.68%	4.37%	0.67	3.66%
80-85	3.38%	7.19%	0.33	6.01%
85-90	31.43%	10.99%	3.00	9.33%
90-95	17.39%	16.24%	1.00	14.87%
95-100	50.00%	21.56%	0.00	21.29%
100-105	100.00%	31.92%	0.00	31.72%
105-110	0.00%	0.00%	0.00	0.00%

D. Mortality Rates – Post-Retirement (continued)

Female

Age Group	Actual	Expected	Ratio	Recommended
55-60	0.57%	0.32%	0.00	0.24%
60-65	0.00%	0.53%	0.00	0.45%
65-70	0.19%	0.88%	0.00	0.86%
70-75	1.50%	1.61%	1.00	1.38%
75-80	0.86%	3.04%	0.33	2.27%
80-85	2.88%	5.26%	0.67	3.96%
85-90	10.65%	8.25%	1.67	6.65%
90-95	15.69%	12.93%	1.33	11.01%
95-100	27.78%	21.79%	1.50	18.27%
100-105	46.67%	32.13%	2.00	25.34%
105-110	100.00%	43.84%	0.00	31.71%

D. Mortality Rates – Post-Retirement (continued)

Findings and Recommendations

Post-retirement experience was different on a gender basis. The current mortality assumption overstated male experience and understated female experience. The current healthy mortality table, 1983 Group Annuity Mortality (GAM) has been the standard table used in the valuation of retirement plans for decades. However, newer tables exist that more accurately reflect retirement plan participant healthy mortality. To better match experience and allow for anticipated improvements in mortality, we recommend that the healthy mortality assumption be changed to the 1994 GAM table set back two years for both males and females.

The complete tables of recommended mortality rates for non-disabled retirees are shown in Appendix F.

The actual/expected ratios of the recommended assumptions are as follows:

Males:	108.52%
Females	111.48%

E. Mortality Rates – Pre-Retirement

The pre-retirement mortality rates used in actuarial valuations project the percentage of non-disabled active employees who are expected to die during the upcoming year.

Current Actuarial Assumptions

The mortality table for active male employees currently used for the 2006 actuarial valuation is the 1983 Group Annuity Mortality Table for males, set back 10 years. The mortality table for active female employees is the 1983 Group Annuity Mortality Table for females, set back seven years. The mortality rates are shown below for certain ages:

Mortality Rates

Age	Male	Female
20	0.03%	0.01%
25	0.03%	0.02%
30	0.04%	0.02%
35	0.05%	0.03%
40	0.06%	0.04%
45	0.09%	0.06%
50	0.12%	0.08%
55	0.22%	0.14%

E. Mortality Rates – Pre-Retirement (continued)

The tables below and on the next page summarize the total number of deaths in each age group, the actual average number and the expected average number based on the assumed death rates for male and female participants.

Male

Age Group	Number of Deaths Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
25-30	0	0	0	0	0	0	0.00
30-35	0	0	0	0	0	0	0.00
35-40	0	0	0	0	0	0	0.00
40-45	0	0	0	0	0	0	0.00
45-50	0	0	0	0	0	0	0.00
50-55	0	0	0	0	0	0	0.00
55-60	1	0	0	0	0	0	0.00
60-65	0	0	0	0	0	0	0.00
65-70	0	0	0	0	0	0	0.00
Total	**1**	**0**	**0**	**0**	**0**	**0**	**0.00**

E. Mortality Rates – Pre-Retirement (continued)

Female

Age Group	Number of Deaths Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
25-30	0	0	0	0	0	0	0.00
30-35	0	0	0	0	0	0	0.00
35-40	0	0	0	0	0	0	0.00
40-45	1	0	0	0	0	0	0.00
45-50	0	0	0	0	0	0	0.00
50-55	0	0	0	0	0	0	0.00
55-60	0	0	0	0	0	0	0.00
60-65	0	0	0	0	0	0	0.00
65-70	0	0	0	0	0	0	0.00
Total	**1**	**0**	**0**	**0**	**0**	**0**	**0.00**

E. Mortality Rates – Pre-Retirement (continued)

The tables below summarize the actual, expected, and recommended pre-retirement mortality rates for male and female participants for certain ages.

Male

Age Group	Actual	Expected	Ratio	Recommended
25-30	0.00%	0.03%	0.00	0.07%
30-35	0.00%	0.04%	0.00	0.08%
35-40	0.00%	0.05%	0.00	0.09%
40-45	0.00%	0.07%	0.00	0.11%
45-50	0.00%	0.10%	0.00	0.16%
50-55	0.00%	0.16%	0.00	0.27%
55-60	0.37%	0.27%	0.00	0.43%
60-65	0.00%	0.44%	0.00	0.73%
65-70	0.00%	0.70%	0.00	1.02%

Female

Age Group	Actual	Expected	Ratio	Recommended
25-30	0.00%	0.02%	0.00	0.03%
30-35	0.00%	0.03%	0.00	0.04%
35-40	0.00%	0.03%	0.00	0.05%
40-45	0.23%	0.05%	0.00	0.07%
45-50	0.00%	0.07%	0.00	0.10%
50-55	0.00%	0.10%	0.00	0.15%
55-60	0.00%	0.16%	0.00	0.22%
60-65	0.00%	0.24%	0.00	0.40%
65-70	0.00%	0.43%	0.00	0.59%

E. Mortality Rates – Pre-Retirement (continued)

Findings and Recommendations

For non-disabled active employees, actual experience shows that plan participants are healthy, dying at a lower rate than the current tables project, even with the large set backs (10 years for males, seven years for females). We do not feel it would be prudent to set back the table even further. Therefore, we recommend the healthy pre-retirement mortality assumptions be updated to allow for anticipated improvements in mortality, hence changing to a newer table (which is also used for the healthy post-retirement mortality rates) of the 1994 GAM table, set back two years for both males and females.

The complete tables of recommended mortality rates for non-disabled active employees are shown in Appendix G.

F. Mortality Rates – Disabled

The disabled mortality rates used in actuarial valuations project the percentage of disabled actives and retirees who are expected to die in the upcoming year. Mortality for disabled members is expected to be higher than mortality for non-disabled members.

Current Actuarial Assumptions

The mortality table for disabled members currently used for the July 1, 2006 actuarial valuation is the 1977 Railroad Retirement Board (RRB) Mortality Table for Disabled Lives. The mortality rates are shown below for certain ages:

Age	Male	Female
35	2.73%	2.73%
40	2.73%	2.73%
45	2.74%	2.74%
50	2.89%	2.89%
55	3.71%	3.71%
60	4.73%	4.73%
65	5.98%	5.98%
70	7.46%	7.46%
75	9.19%	9.19%
80	12.28%	12.28%
85	14.89%	14.89%
90	20.26%	20.26%
95	27.32%	27.32%

F. Mortality Rates – Disabled (continued)

The tables below summarize the total number of disabled deaths in each age group, the actual average number and the expected number based on the assumed disability mortality rates for male and female participants.

Male

Age Group	Number of Disabled Deaths Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
40-45	0	0	0	0	0	0	0.00
45-50	0	0	0	0	0	0	0.00
50-55	0	0	0	0	0	0	0.00
55-60	0	0	0	0	0	0	0.00
60-65	0	0	0	0	0	0	0.00
65-70	0	0	0	0	0	0	0.00
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**

Female

Age Group	Number of Disabled Deaths Fiscal Year Ended June 30				Average Per Year		
	2003	2004	2005	2006	Actual	Expected	Ratio
40-45	0	0	0	0	0	0	0.00
45-50	0	0	0	0	0	0	0.00
50-55	0	0	0	0	0	0	0.00
55-60	0	0	0	0	0	0	0.00
60-65	0	0	0	0	0	0	0.00
65-70	0	0	0	0	0	0	0.00
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**

F. Mortality Rates – Disabled (continued)

The tables below summarize the actual, expected, and recommended disabled mortality rates for male and female participants.

Male

Age Group	Actual	Expected	Ratio	Recommended
40-45	0.00%	0.00%	0.00	0.00%
45-50	0.00%	0.00%	0.00	0.00%
50-55	0.00%	0.00%	0.00	0.00%
55-60	0.00%	4.29%	0.00	3.87%
60-65	0.00%	5.19%	0.00	2.20%
65-70	0.00%	0.00%	0.00	0.00%

Female

Age Group	Actual	Expected	Ratio	Recommended
40-45	0.00%	0.00%	0.00	0.00%
45-50	0.00%	2.83%	0.00	2.71%
50-55	0.00%	0.00%	0.00	0.00%
55-60	0.00%	4.17%	0.00	2.55%
60-65	0.00%	4.90%	0.00	1.71%
65-70	0.00%	6.13%	0.00	0.72%

F. Mortality Rates – Disabled (continued)

Findings and Recommendations

For active employees, actual experience shows disabled mortality occurs with less than expected frequency. We do not currently receive data on which post-retirement members left active service as a result of disability. Since the current practice is to use the healthy post-retirement mortality table for all post-retirement members and beneficiaries, we recommend a change to update the disabled mortality table to a more current table and phase-in rates to match post-retirement mortality assumptions at later ages. Therefore, we recommend changing to the mortality table described as Disabled Eligible for Social Security Disability – ERISA Section 4044 for 2006 valuation dates (SS 2006) for both males and females for ages through 54. For ages 55 to 64, graded rates were developed between the SS 2006 rates and the healthy post-retirement mortality table (1994 GAM set back two years for both males and females). For ages 65 and later, the healthy post-retirement mortality table (1994 GAM table set back two years for both males and females) is recommended. This assumption reflects a margin for future mortality improvements for disabled members.

The complete table of recommended mortality rates for disabled members is shown in Appendix H.

G. Percent Married

Current Actuarial Assumptions

80% of members and are assumed to be married.

Findings and Recommendations

We were not provided with data to analyze this assumption. However, the current assumption seems reasonable compared to other funds.

H. Presence and Age of Beneficiary

Current Actuarial Assumptions

Females are assumed to be three years younger than males.

Findings and Recommendations

On average, counts of all current retirees have shown that male retirees are about three years older than their female spouses and that female retirees are about one year younger than their male spouses. Therefore, the current assumption remains reasonable.

I. Optional Form of Annuity

Current Actuarial Assumptions

For male retirees, 35% are assumed to elect a 50% Joint and Survivor annuity and 55% are assumed to elect a 100% Joint and Survivor annuity. For female retirees, 25% are assumed to elect a 50% Joint and Survivor annuity and 25% are assumed to elect a 100% Joint and Survivor annuity.

Findings and Recommendations

We recommend the assumptions be changed to better reflect experience, such that for male retirees, 30% are assumed to elect a 50% Joint and Survivor annuity and 40% are assumed to elect a 100% Joint and Survivor annuity. For female retirees, 15% are assumed to elect a 50% Joint and Survivor annuity and 15% are assumed to elect a 100% Joint and Survivor annuity.

Actuarial Cost Method

The actuarial cost method is the procedure used to allocate the cost of the plan among different plan years. A portion of the value of benefits is attributable to past service (actuarial accrued liability) and the remainder (the present value of future normal costs) is attributable to future service. Recent actuarial valuations have been based on the actuarial cost method known as the Entry Age Normal Actuarial Cost Method. This method produces costs that remain relatively level as a percentage of covered payroll. Under the Entry Age Normal Cost Method, the total contribution requirement has two components - an annual normal cost, and a payment with respect to the unfunded actuarial accrued liability. The annual normal cost is calculated for each active employee as the level percentage of pay required over the employee's period of assumed employment to pay the total expected benefits. If actuarial assumptions are met, the total normal cost rate will remain level as a percentage of payroll.

The actuarial accrued liability is the portion of the present value of future benefits that will not be covered by future normal costs. The unfunded actuarial accrued liability is the amount of the accrued liability in excess of the actuarial value of assets. It is paid (amortized) in installments over a period of years, *i.e.* the funding period.

Approximately 75% of large public retirement systems use the Entry Age Normal Cost Method. We recommend that the use of the current actuarial cost method be continued.

Amortization Schedule

The current amortization schedule under the Association is defined as a closed amortization period ending July 1, 2032, for years when there exists a positive unfunded actuarial accrued liability (UAAL). During the years where there is a negative UAAL, the surplus amount is amortized over 30 years as a level percentage of payroll.

This schedule creates volatility in the actuarial required contribution. Since gains and losses are amortized over a steadily decreasing (closed) period, this method can result in highly variable

contribution rates from year to year. As the amortization period approaches zero, the more variable the rate becomes (for example, a loss in 2031 would have to be paid off in one year).

We recommend the Association undertake a study to select an amortization method that satisfies a requirement of paying off the UAAL within a reasonable period of time and that reduces volatility in the rate. Reducing rate volatility will help with budget and planning, while still satisfying the funding requirements of the Association.

APPENDIX A

SUMMARY OF RECOMMENDATIONS

Assumption/Method	July 1, 2006 Actuarial Valuation	Recommended Assumption/Method
Inflation	5.00% per annum	Conduct broader study
Investment Return	8.50% per annum, net of investment expenses	Conduct broader study
Salary Increases	Age and service based rates with 10-year select period	Change in select period rates, and decrease in ultimate rates after age 50
Payroll Growth	5.00% per annum	No change
Withdrawal	Age and service based rates with three-year select period	Increase select period rates. No change to ultimate rates.
Disability Incidence	Age based rates	No change
Retirement	Age based rates for Rule of 90 retirements. Age based rates for all other retirements, Old Plan and New Plan have separate rates	Increase Rule of 90 retirement rates for ages after 66 to 100%, increase rates for all other retirements under New Plan to match Old Plan through age 66, and increase the rate to 100% for all members ages 67 and later.
Post-Retirement Mortality	1983 GAM Table set back two years for males and no set back for females	1994 GAM table set back two years for both males and females
Pre-Retirement Mortality	1983 GAM Table set back 10 years for males and seven years for females	1994 GAM table set back two years for both males and females
Disabled Mortality	1977 Railroad Retirement Board Mortality Table for Disabled Lives	Disabled Eligible for Social Security disability – ERISA Section 4044 for 2006 valuation dates through age 54, graded to healthy post-retirement mortality at age 65

APPENDIX A

SUMMARY OF RECOMMENDATIONS (continued)

Assumption/Method	July 1, 2006 Actuarial Valuation	Recommended Assumption/Method
Beneficiary Mortality	1983 GAM Table set back two years for males and no set back for females	1994 GAM table set back two years for both males and females
Dependent Children	No dependent children are assumed	No change
Marital Status	80% of members are assumed to be married	No change
Spouse Age	Females are assumed to be three years younger than males	No change
Optional Form Election	Joint and Survivor Annuities elected at gender-based rates	Decrease rates
Actuarial Cost Method	Entry Age Normal	No change
Amortization Method	Closed amortization period ending July 1, 2032 if positive UAAL; 30 years as of July 1, 2006 due to surplus	Recommend ongoing review and broader study with the Association

APPENDIX A

SUMMARY OF RECOMMENDATIONS (continued)

Assumption/Method	Segal Recommendation	Authority: MN Statutes or LCPR	Effect of Change on Funded Ratio I=Increase D=Decrease
1. Inflation	Broader Study	Sec. 356.215, Subd. 8c	N/A
2. Investment Return	Broader Study	Sec. 356.215, Subd. 8a	N/A
3. Salary Increases	Change – See Report	Sec. 356.215, Subd. 8b(3)	Increase
4. Payroll Growth	No Change	Sec. 356.215, Subd. 8c	N/A
5. Actuarial Cost Method	No Change	Sec. 356.215, Subd. 4b, Subd. 5, Subd. 6	N/A
6. Amortization Method	Broader Study	Sec. 356.215, Subd. 11	N/A
7 .Withdrawal	Change – See Report	LCPR	Increase
8. Disability Incidence	No Change	LCPR	N/A
9. Retirement	Change – See Report	LCPR	Decrease
10. Post-Retirement Mortality	Change – See Report	LCPR	Decrease
11. Pre-Retirement Mortality	Change – See Report	LCPR	Increase
12. Disabled Mortality	Change – See Report	LCPR	Decrease
13. Beneficiary Mortality	Change – See Report	LCPR	Decrease
14. Dependent Children	No Change	LCPR	N/A
15. Marital Status	No Change	LCPR	N/A
16. Spouse Age	No Change	LCPR	N/A
17. Optional Form Election	Change – See Report	LCPR	Decrease

APPENDIX B

RECOMMENDED SALARY INCREASES

Select Period Rates		
Years of Service	**Male**	**Female**
1 - 2	8.00%	8.00%
2 - 3	8.00%	8.00%
3 - 4	8.00%	8.00%
4 - 5	8.00%	8.00%
5 - 6	8.00%	8.00%
6 - 7	8.00%	8.00%
7 - 8	7.25%	7.25%
8 - 9	6.50%	6.50%

Ultimate Rates						
Age	**Male**	**Female**		**Age**	**Male**	**Female**
20	6.90%	6.90%		43	5.70%	5.70%
21	6.90%	6.90%		44	5.60%	5.60%
22	6.90%	6.90%		45	5.50%	5.50%
23	6.85%	6.85%		46	5.40%	5.40%
24	6.80%	6.80%		47	5.30%	5.30%
25	6.75%	6.75%		48	5.20%	5.20%
26	6.70%	6.70%		49	5.10%	5.10%
27	6.65%	6.65%		50	5.00%	5.00%
28	6.60%	6.60%		51	4.90%	4.90%
29	6.55%	6.55%		52	4.80%	4.80%
30	6.50%	6.50%		53	4.70%	4.70%
31	6.45%	6.45%		54	4.60%	4.60%
32	6.40%	6.40%		55	4.50%	4.50%
33	6.35%	6.35%		56	4.40%	4.40%
34	6.30%	6.30%		57	4.30%	4.30%
35	6.25%	6.25%		58	4.20%	4.20%
36	6.20%	6.20%		59	4.10%	4.10%
37	6.15%	6.15%		60	4.00%	4.00%
38	6.10%	6.10%		61	3.90%	3.90%
39	6.05%	6.05%		62	3.80%	3.80%
40	6.00%	6.00%		63	3.70%	3.70%
41	5.90%	5.90%		64	3.60%	3.60%
42	5.80%	5.80%		65	3.50%	3.50%

APPENDIX C

RECOMMENDED WITHDRAWAL RATES

Years of Service	Male	Female
First Year	60.00%	60.00%
Second Year	20.00%	20.00%
Third Year	15.00%	15.00%

Age	Male	Female
20	3.50%	3.50%
21	3.45%	3.45%
22	3.40%	3.40%
23	3.35%	3.35%
24	3.30%	3.30%
25	3.25%	3.25%
26	3.20%	3.20%
27	3.15%	3.15%
28	3.10%	3.10%
29	3.05%	3.05%
30	3.00%	3.00%
31	2.95%	2.95%
32	2.90%	2.90%
33	2.85%	2.85%
34	2.80%	2.80%
35	2.75%	2.75%
36	2.70%	2.70%
37	2.65%	2.65%
38	2.60%	2.60%
39	2.55%	2.55%
40	2.50%	2.50%
41	2.40%	2.40%
42	2.30%	2.30%
43	2.20%	2.20%

APPENDIX C

RECOMMENDED WITHDRAWAL RATES (continued)

Age	Male	Female
44	2.10%	2.10%
45	2.00%	2.00%
46	1.90%	1.90%
47	1.80%	1.80%
48	1.70%	1.70%
49	1.60%	1.60%
50	1.50%	1.50%
51	1.35%	1.35%
52	1.20%	1.20%
53	1.05%	1.05%
54	0.90%	0.90%
55	0.75%	0.75%
56	0.60%	0.60%
57	0.45%	0.45%
58	0.30%	0.30%
59	0.15%	0.15%

APPENDIX D

RECOMMENDED DISABILITY INCIDENCE RATES

Age	Male	Female
35	0.01%	0.01%
36	0.01%	0.01%
37	0.01%	0.01%
38	0.01%	0.01%
39	0.01%	0.01%
40	0.03%	0.03%
41	0.03%	0.03%
42	0.03%	0.03%
43	0.03%	0.03%
44	0.03%	0.03%
45	0.06%	0.06%
46	0.06%	0.06%
47	0.06%	0.06%
48	0.06%	0.06%
49	0.06%	0.06%
50	0.10%	0.10%
51	0.10%	0.10%
52	0.10%	0.10%
53	0.10%	0.10%
54	0.10%	0.10%
55	0.15%	0.15%
56	0.15%	0.15%
57	0.15%	0.15%
58	0.15%	0.15%
59	0.15%	0.15%
60	0.21%	0.21%
61	0.21%	0.21%
62	0.21%	0.21%
63	0.21%	0.21%
64	0.21%	0.21%

APPENDIX E

RETIREMENT RATES

Age	Rule of 90 Retirement	All Other Retirements
55	40.00%	15.00%
56	40.00%	15.00%
57	40.00%	15.00%
58	40.00%	15.00%
59	40.00%	15.00%
60	40.00%	15.00%
61	40.00%	40.00%
62	40.00%	40.00%
63	40.00%	40.00%
64	40.00%	40.00%
65	40.00%	40.00%
66	40.00%	50.00%
67	100.00%	100.00%

APPENDIX F

RECOMMENDED POST-RETIREMENT MORTALITY RATES

Age	Male	Female
20	0.0460%	0.0273%
21	0.0484%	0.0280%
22	0.0507%	0.0284%
23	0.0530%	0.0286%
24	0.0556%	0.0289%
25	0.0589%	0.0292%
26	0.0624%	0.0291%
27	0.0661%	0.0291%
28	0.0696%	0.0294%
29	0.0727%	0.0302%
30	0.0754%	0.0314%
31	0.0779%	0.0331%
32	0.0801%	0.0351%
33	0.0821%	0.0373%
34	0.0839%	0.0397%
35	0.0848%	0.0422%
36	0.0849%	0.0449%
37	0.0851%	0.0478%
38	0.0862%	0.0512%
39	0.0891%	0.0551%
40	0.0939%	0.0598%
41	0.0999%	0.0652%
42	0.1072%	0.0709%
43	0.1156%	0.0768%
44	0.1252%	0.0825%
45	0.1352%	0.0877%
46	0.1458%	0.0923%
47	0.1578%	0.0973%

APPENDIX F

RECOMMENDED POST-RETIREMENT MORTALITY RATES (continued)

Age	Male	Female
48	0.1722%	0.1033%
49	0.1899%	0.1112%
50	0.2102%	0.1206%
51	0.2326%	0.1310%
52	0.2579%	0.1428%
53	0.2872%	0.1568%
54	0.3213%	0.1734%
55	0.3584%	0.1907%
56	0.3979%	0.2084%
57	0.4425%	0.2294%
58	0.4949%	0.2563%
59	0.5581%	0.2919%
60	0.6300%	0.3359%
61	0.7090%	0.3863%
62	0.7976%	0.4439%
63	0.8986%	0.5093%
64	1.0147%	0.5832%
65	1.1471%	0.6677%
66	1.2940%	0.7621%
67	1.4535%	0.8636%
68	1.6239%	0.9694%
69	1.8034%	1.0764%
70	1.9859%	1.1763%
71	2.1729%	1.2709%
72	2.3730%	1.3730%
73	2.5951%	1.4953%
74	2.8481%	1.6506%

APPENDIX F

RECOMMENDED POST-RETIREMENT MORTALITY RATES (continued)

Age	Male	Female
75	3.1201%	1.8344%
76	3.4051%	2.0381%
77	3.7211%	2.2686%
78	4.0858%	2.5325%
79	4.5171%	2.8366%
80	5.0211%	3.1727%
81	5.5861%	3.5362%
82	6.2027%	3.9396%
83	6.8615%	4.3952%
84	7.5532%	4.9153%
85	8.2510%	5.4857%
86	8.9613%	6.0979%
87	9.7240%	6.7738%
88	10.5792%	7.5347%
89	11.5671%	8.4023%
90	12.6980%	9.3820%
91	13.9452%	10.4594%
92	15.2931%	11.6265%
93	16.7260%	12.8751%
94	18.2281%	14.1973%
95	19.8392%	15.5931%
96	21.5700%	17.0677%
97	23.3606%	18.6213%
98	25.1510%	20.2538%
99	26.8815%	21.9655%
100	28.5277%	23.7713%

APPENDIX G

RECOMMENDED PRE-RETIREMENT MORTALITY

Age	Male	Female
20	0.0460%	0.0273%
21	0.0484%	0.0280%
22	0.0507%	0.0284%
23	0.0530%	0.0286%
24	0.0556%	0.0289%
25	0.0589%	0.0292%
26	0.0624%	0.0291%
27	0.0661%	0.0291%
28	0.0696%	0.0294%
29	0.0727%	0.0302%
30	0.0754%	0.0314%
31	0.0779%	0.0331%
32	0.0801%	0.0351%
33	0.0821%	0.0373%
34	0.0839%	0.0397%
35	0.0848%	0.0422%
36	0.0849%	0.0449%
37	0.0851%	0.0478%
38	0.0862%	0.0512%
39	0.0891%	0.0551%
40	0.0939%	0.0598%
41	0.0999%	0.0652%
42	0.1072%	0.0709%
43	0.1156%	0.0768%
44	0.1252%	0.0825%
45	0.1352%	0.0877%
46	0.1458%	0.0923%

APPENDIX G

RECOMMENDED PRE-RETIREMENT MORTALITY (continued)

Age	Male	Female
47	0.1578%	0.0973%
48	0.1722%	0.1033%
49	0.1899%	0.1112%
50	0.2102%	0.1206%
51	0.2326%	0.1310%
52	0.2579%	0.1428%
53	0.2872%	0.1568%
54	0.3213%	0.1734%
55	0.3584%	0.1907%
56	0.3979%	0.2084%
57	0.4425%	0.2294%
58	0.4949%	0.2563%
59	0.5581%	0.2919%
60	0.6300%	0.3359%
61	0.7090%	0.3863%
62	0.7976%	0.4439%
63	0.8986%	0.5093%
64	1.0147%	0.5832%
65	1.1471%	0.6677%
66	1.2940%	0.7621%
67	1.4535%	0.8636%
68	1.6239%	0.9694%
69	1.8034%	1.0764%
70	1.9859%	1.1763%
71	2.1729%	1.2709%
72	2.3730%	1.3730%
73	2.5951%	1.4953%

APPENDIX G

RECOMMENDED PRE-RETIREMENT MORTALITY (continued)

Age	Male	Female
74	2.8481%	1.6506%
75	3.1201%	1.8344%
76	3.4051%	2.0381%
77	3.7211%	2.2686%
78	4.0858%	2.5325%
79	4.5171%	2.8366%
80	5.0211%	3.1727%
81	5.5861%	3.5362%
82	6.2027%	3.9396%
83	6.8615%	4.3952%
84	7.5532%	4.9153%
85	8.2510%	5.4857%
86	8.9613%	6.0979%
87	9.7240%	6.7738%
88	10.5792%	7.5347%
89	11.5671%	8.4023%
90	12.6980%	9.3820%
91	13.9452%	10.4594%
92	15.2931%	11.6265%
93	16.7260%	12.8751%
94	18.2281%	14.1973%
95	19.8392%	15.5931%
96	21.5700%	17.0677%
97	23.3606%	18.6213%
98	25.1510%	20.2538%
99	26.8815%	21.9655%
100	28.5277%	23.7713%

APPENDIX H

RECOMMENDED DISABLED MORTALITY RATES

Age	Male	Female
20	2.4583%	0.9650%
21	2.5133%	1.0076%
22	2.5697%	1.0521%
23	2.6269%	1.0984%
24	2.6857%	1.1468%
25	2.7457%	1.1974%
26	2.8071%	1.2502%
27	2.8704%	1.3057%
28	2.9345%	1.3632%
29	2.9999%	1.4229%
30	3.0661%	1.4843%
31	3.1331%	1.5473%
32	3.2006%	1.6103%
33	3.2689%	1.6604%
34	3.3405%	1.7121%
35	3.4184%	1.7654%
36	3.4981%	1.8204%
37	3.5796%	1.8770%
38	3.6634%	1.9355%
39	3.7493%	1.9957%
40	3.8373%	2.0579%
41	3.9272%	2.1219%
42	4.0189%	2.1880%
43	4.1122%	2.2561%
44	4.2071%	2.3263%
45	4.3033%	2.3988%
46	4.4007%	2.4734%
47	4.4993%	2.5504%

APPENDIX H

RECOMMENDED DISABLED MORTALITY RATES (continued)

Age	Male	Female
48	4.5989%	2.6298%
49	4.6993%	2.7117%
50	4.8004%	2.7961%
51	4.9021%	2.8832%
52	5.0042%	2.9730%
53	5.1067%	3.0655%
54	5.2093%	3.1609%
55	4.8620%	2.9800%
56	4.5020%	2.7880%
57	4.1270%	2.5830%
58	3.7480%	2.3670%
59	3.3670%	2.1420%
60	2.9850%	1.9100%
61	2.6030%	1.6700%
62	2.2230%	1.4250%
63	1.8500%	1.1740%
64	1.4900%	0.9210%
65	1.1471%	0.6677%
66	1.2940%	0.7621%
67	1.4535%	0.8636%
68	1.6239%	0.9694%
69	1.8034%	1.0764%
70	1.9859%	1.1763%
71	2.1729%	1.2709%
72	2.3730%	1.3730%
73	2.5951%	1.4953%
74	2.8481%	1.6506%
75	3.1201%	1.8344%

APPENDIX H

RECOMMENDED DISABLED MORTALITY RATES (continued)

Age	Male	Female
76	3.4051%	2.0381%
77	3.7211%	2.2686%
78	4.0858%	2.5325%
79	4.5171%	2.8366%
80	5.0211%	3.1727%
81	5.5861%	3.5362%
82	6.2027%	3.9396%
83	6.8615%	4.3952%
84	7.5532%	4.9153%
85	8.2510%	5.4857%
86	8.9613%	6.0979%
87	9.7240%	6.7738%
88	10.5792%	7.5347%
89	11.5671%	8.4023%
90	12.6980%	9.3820%
91	13.9452%	10.4594%
92	15.2931%	11.6265%
93	16.7260%	12.8751%
94	18.2281%	14.1973%
95	19.8392%	15.5931%
96	21.5700%	17.0677%
97	23.3606%	18.6213%
98	25.1510%	20.2538%
99	26.8815%	21.9655%
100	28.5277%	23.7713%