

June 2004

Experience Study

1998- 2003

Minnesota State Retirement System
Correctional Employees
Retirement Fund

MERCER

Human Resource Consulting

Contents

Introduction.....	1
Basis of Study.....	2
▪ Plan Participants.....	3
▪ Actuarial Methodology	4
▪ Actuarial Assumptions	5
Results of Study	8
▪ Withdrawal.....	9
▪ Retirement.....	14
▪ Disability	21
▪ Active Mortality	26
▪ Retiree and Beneficiary Mortality	28
▪ Disability Retiree Mortality	35
▪ Salary Scale	37
▪ Investment Return	39
Summary of Observations	41

Introduction

This report presents the results of an analysis of the experience of the Minnesota State Retirement System Correctional Employees Retirement Fund over the five-year period from July 1, 1998 to June 30, 2003.

This report is divided into three sections. The first section describes the plan participants included in the study, the actuarial methods employed and the current actuarial assumptions used to perform the annual valuation. The second section details the results of the study separately for each assumption. The third section summarizes the results and present conclusions to the Board.

It is our opinion that this report is, to the best of our knowledge, complete and accurate. The actuarial methods are applied on an objective basis and are appropriate for the purpose at hand. Therefore, the information contained in this report fully and fairly discloses the experience of the Minnesota State Retirement System State Patrol Plan over the period July 1, 1998 to June 30, 2003.

We are available to answer any questions with respect to this report or to provide explanations or further details, as may be appropriate. The undersigned credentialed actuary meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. In addition, the undersigned credentialed actuary meets the definition of "approved actuary" in Minnesota Statutes, Section 356.215.



Stephen T. McElhaney, FSA

Date

6/4/2004



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Basis of Study

This section:

- Describes the sources of membership data used in the study.
- Describes the actuarial methods employed in the study.
- Summarizes the current set of actuarial assumptions used in the annual valuation of the Fund.

Plan Participants

The individuals included in this study were members of the Minnesota State Retirement System Correctional Employees Retirement Fund during the period from July 1, 1998 through June 30, 2003.

Census information gathered for the last five actuarial valuations formed the basis for this study. This census information and the current actuarial assumptions described on page 5 were used to determine the expected number of terminations, deaths, withdrawals, disabilities and retirements during the period under consideration.

The actual terminations, deaths, disabilities, withdrawals and retirements were accumulated on an annual basis from records used in each actuarial valuation. The records include specific information received from the Minnesota State Retirement System office in the preparation of each actuarial valuation. This information was reviewed for accuracy and consistency.

Actuarial Methodology

For any retirement system, actuarial assumptions employed are intended to be reasonable estimates of future expected events that could affect the amount and timing of benefits and the assets accumulated. These assumptions, along with an actuarial cost method, the employee census data and the provisions outlined in the statutes are used to determine the overall funding requirements for the Plan. The true cost to the Plan over time will be the actual benefit payments and expenses required by the statutes for the participant group covered under the Plan, less the investment return realized on trust assets. To the extent the actual experience deviates from the assumptions, experience gains and losses will occur. These gains (losses) then serve to reduce (increase) future contribution levels. The actuarial assumptions should be reasonable and should be reviewed periodically to insure that they remain appropriate. The actuarial cost method used to determine contributions, however, automatically adjusts over time for differences between what is assumed and the true experience under the Plan.

Decrementals

For the withdrawal, mortality, disability and retirement studies, the following procedure was used. Based upon the current rates of decrement described on pages 5 through 7 and the census information described on page 3, expected numbers of withdrawals, deaths, disabilities and retirements were determined for each age and then accumulated into five-year age groupings, (except for retirement, which was analyzed at distinct ages). The expected occurrences were then compared to the actual number of occurrences over the period under investigation.

Salary Increases

For the salary increase study, fiscal year pay for each year from July 1, 1998 through June 30, 2003 was used. For each participant who was active on two consecutive valuation dates, with at least two years of service, we calculated the salary increase as a percentage of the prior year's pay. These actual salary increases were then compared to the expected salary increases over the period of investigation, in five-year age and service groupings.

For purposes of comparing actual salary increases to assumed salary increases, we excluded all individuals whose pay increased or decreased 20% or more. While this was a relatively small group, their salary increases distorted the experience of the overall group of continuing active participants.

Actuarial Assumptions

Economic	
Investment Return	Pre-Retirement: 8.5% Post-Retirement: 6.0%
Salary Increases	Annual increases according to table on next page.
Benefit Increases after Retirement	Payment of earnings in post-retirement fund in excess of 6% post-retirement assumption.
Other	
Mortality	Pre-Retirement: Male: 1983 Group Annuity Mortality for males set back 1 year Female: 1983 Group Annuity Mortality for females Post-Retirement: Male: 1983 Group Annuity Mortality for males set forward 2 years Female: 1983 Group Annuity Mortality for females set forward 2 years Post-Disability: Combined Annuity Mortality
Withdrawal	Refer to Tables on following pages
Expenses	Prior year expenses expressed as a percentage of prior year payroll
Disability	Refer to Tables on following pages
Retirement	Refer to Tables on following pages
Percentage Married at Retirement	85%
Age Difference	Males are assumed to be three years older than female spouses
Benefit Election	Married Males 25% elect 50% J&S 25% elect 100% J&S Married Females 5% elect 50% J&S 5% elect 100% J&S

Actuarial Assumptions (continued)**TABLE OF SAMPLE SALARY INCREASES**

<u>Age</u>	<u>Increase</u>
20	7.75%
25	7.00%
30	7.00%
35	7.00%
40	6.50%
45	5.75%
50	5.50%
55+	5.25%

TABLE OF SAMPLE DISABILITY RATES

<u>Age</u>	<u>Males and Females</u>
20	.04%
25	.06%
30	.08%
35	.11%
40	.18%
45	.29%
50	.50%
55	.88%
60	1.41%
63+	0.0%

Actuarial Assumptions (continued)**TABLE OF SAMPLE WITHDRAWAL RATES**

<u>Attained Age</u>	<u>Males</u>	<u>Females</u>
20	24.00%	16.00%
25	14.70%	14.20%
30	9.10%	13.50%
35	6.00%	12.90%
40	4.40%	10.40%
45	3.40%	6.40%
50	2.40%	4.70%
55	1.40%	3.30%
60+	0.00%	0.00%

TABLE OF RETIREMENT RATES

<u>Attained Age</u>	<u>Males and Females</u>
50-53	2%
54	20%
55	60%
56-61	20%
62-64	50%
65	100%

Results of Study

- **Withdrawal**
- **Retirement**
- **Disability**
- **Active Mortality**
- **Retiree and Beneficiary Mortality**
- **Disability Retiree Mortality**
- **Salary Increases**
- **Investment Return**

Withdrawal

Basis of Analysis

The withdrawal rates specify the assumed probability that a given employee will leave employment within the following year for reasons other than retirement, death or disability. For most employees, these probabilities are much higher for employees at younger ages with relatively few years of service and decline quickly as service and age increases. Currently, the Minnesota State Retirement System Correctional Employees Retirement Fund uses age-related termination rates that trend downward as age increases.

Historical Data

During the five years from 1998 through 2003, the actual number of withdrawals was lower than expected (1,122 actual versus 2,197 expected). For members with less than 3 years of service, the actual number of withdrawals was higher than assumed, (527 actual versus 472 expected). However, for members with 3 or more years of service, actual withdrawals were just 35% of expected, (595 actual versus 1,724 expected).

There was not a significant gender difference in the withdrawal experience. Actual number of withdrawals was 50% of expected for males and 52% of expected for females.

Withdrawal (continued)

1998-2003 Terminations

Age	Less Than 3 Years			3+ Years			Total		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	43	76.69	56%	3	78.46	4%	46	155.15	30%
25-29	51	162.10	93%	75	309.94	24%	226	472.04	48%
30-34	12	92.92	121%	149	397.90	37%	261	490.82	53%
35-39	83	60.65	137%	114	344.27	33%	197	404.92	49%
40-44	60	42.07	143%	100	284.97	35%	160	327.04	49%
45-49	42	23.34	180%	80	182.42	44%	122	205.76	59%
50-54	25	11.63	215%	48	109.92	44%	73	121.55	60%
55-59	7	2.89	242%	20	15.63	128%	27	18.52	146%
60-64	3	0.00	N/A	6	0.00	N/A	9	0.00	N/A
65+	1	0.00	N/A	0	1.00	0%	1	0.00	100%
	527	472.30	112%	595	1,724.49	35%	1,122	2,196.79	51%

Age	Males			Females			Total		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	19	86.76	22%	27	68.39	39%	46	155.15	30%
25-29	113	269.99	42%	113	202.05	56%	226	472.04	48%
30-34	150	264.42	57%	111	226.40	49%	261	490.82	53%
35-39	106	187.50	57%	91	217.42	42%	197	404.92	49%
40-44	71	153.27	46%	89	173.77	51%	160	327.04	49%
45-49	60	106.72	56%	62	99.04	63%	122	205.76	59%
50-54	34	62.88	54%	39	58.67	66%	73	121.55	60%
55-59	14	6.90	203%	13	11.62	112%	27	18.52	146%
60-64	3	0.00	N/A	6	0.00	N/A	9	0.00	N/A
65+	0	0.00	N/A	1	1.00	N/A	1	0.00	100%
	570	1,138.44	50%	552	1,057.35	52%	1,122	2,196.79	51%

Withdrawal (continued)

2002-2003 Terminations			
Age	Actual	Expected	Actual/Expected
20-24	16	37.75	42%
25-29	42	90.72	46%
30-34	58	100.02	58%
35-39	44	85.47	51%
40-44	31	68.64	45%
45-49	28	44.89	62%
50-54	11	27.13	41%
55-59	5	4.51	111%
60-64	3	0.00	N/A
65+	1	0.00	N/A
Total	239	459.13	52%

2001-2002 Terminations			
Age	Actual	Expected	Actual/Expected
20-24	9	39.20	23%
25-29	42	93.00	45%
30-34	56	105.48	53%
35-39	48	87.39	55%
40-44	40	70.96	56%
45-49	24	42.92	56%
50-54	20	26.60	75%
55-59	9	4.22	213%
60-64	1	0.00	N/A
65+	0	0.00	N/A
Total	249	469.77	53%

Withdrawal (continued)

2000-2001 Terminations			
Age	Actual	Expected	Actual/Expected
20-24	9	35.25	26%
25-29	58	100.77	58%
30-34	67	107.24	62%
35-39	43	81.87	53%
40-44	29	69.66	42%
45-49	24	42.40	57%
50-54	24	25.80	93%
55-59	5	3.55	141%
60-64	1	0.00	N/A
65+	0	0.00	N/A
Total	260	466.54	56%

1999-2000 Terminations			
Age	Actual	Expected	Actual/Expected
20-24	7	24.15	29%
25-29	50	97.55	51%
30-34	47	93.19	50%
35-39	32	76.43	42%
40-44	38	62.33	61%
45-49	23	39.82	58%
50-54	10	21.64	46%
55-59	4	3.36	119%
60-64	4	0.00	N/A
65+	0	0.00	N/A
Total	215	418.47	51%

Withdrawal (continued)

Age	1998-1999 Terminations		
	Actual	Expected	Actual/Expected
20-24	5	18.80	27%
25-29	34	89.99	38%
30-34	33	84.89	39%
35-39	30	73.76	41%
40-44	22	55.46	40%
45-49	23	35.73	64%
50-54	8	20.38	39%
55-59	4	2.87	139%
60-64	0	0.00	N/A
65+	0	0.00	N/A
Total	159	381.88	42%

Retirement**Basis of Analysis**

The retirement rates specify the assumed probability that a given employee will retire within the following year. For most plans, these probabilities are higher for older employees or employees with more years of service. Accordingly, retirement rates will usually vary by age or service. In addition, probabilities of retirement are usually higher if employees are eligible to receive full unreduced benefits prior to normal retirement age. Currently, the Minnesota State Retirement System Correctional Employees Retirement Fund uses retirement rates that vary by age.

Historical Data

During the five years from 1998 through 2003, the actual number of retirements was less than expected (386 actual versus 515 expected). The largest discrepancy occurred in the under age 55 group.

Retirement**1998-2003 Retirements**

Age	Actual	Expected	Actual/ Expected	Expected Percent	Actual Percent
50	15	10.28	146%	2%	3%
51	15	10.08	149%	2%	3%
52	15	9.55	157%	2%	3%
53	19	8.29	229%	2%	5%
54	21	74.35	28%	20%	6%
55	219	213.80	102%	60%	62%
56	2	17.43	11%	20%	2%
57	7	15.99	44%	20%	9%
58	7	17.25	41%	20%	8%
59	6	14.91	40%	20%	8%
60	7	13.83	51%	20%	10%
61	7	10.63	66%	20%	13%
62	12	25.30	47%	50%	24%
63	10	18.13	55%	50%	28%
64	7	14.98	47%	50%	23%
65	13	24.08	54%	100%	54%
66	2	7.14	28%	100%	28%
67	0	2.62	0%	100%	0%
68	0	0.85	0%	100%	0%
69	0	2.00	0%	100%	0%
70 +	2	4.00	50%	100%	50%
Total	386	515.48	75%		

Retirement (continued)

2002-2003 Retirements

Age	Actual	Expected	Actual/ Expected	Expected Percent	Actual Percent
50	4	2.19	183%	2%	4%
51	4	2.32	173%	2%	4%
52	0	2.11	0%	2%	0%
53	0	1.79	0%	2%	0%
54	4	16.69	24%	20%	5%
55	62	60.32	103%	60%	62%
56	1	4.32	23%	20%	5%
57	1	3.05	33%	20%	7%
58	1	3.69	27%	20%	5%
59	1	3.46	29%	20%	6%
60	2	3.90	51%	20%	10%
61	1	2.47	40%	20%	8%
62	4	6.15	65%	50%	33%
63	1	2.23	45%	50%	22%
64	1	2.82	35%	50%	18%
65	2	5.66	35%	100%	35%
66	0	1.90	0%	100%	0%
67	0	2.18	0%	100%	0%
68	0	0.44	0%	100%	0%
69	0	0.00	N/A	100%	N/A
70+	0	0.00	N/A	100%	N/A
Total	89	127.68	70%		

Retirement (continued)

2001-2002 Retirements

Age	Actual	Expected	Actual/ Expected	Expected Percent	Actual Percentage
50	7	2.34	299%	2%	6%
51	4	2.14	187%	2%	4%
52	4	1.91	209%	2%	4%
53	4	1.71	235%	2%	5%
54	3	18.44	16%	20%	3%
55	64	57.05	112%	60%	67%
56	0	2.37	0%	20%	0%
57	2	4.03	50%	20%	10%
58	1	3.70	27%	20%	5%
59	0	3.37	0%	20%	0%
60	2	2.85	70%	20%	14%
61	1	2.35	43%	20%	9%
62	2	3.81	53%	50%	26%
63	1	3.33	30%	50%	15%
64	2	3.35	60%	50%	30%
65	2	3.92	51%	100%	51%
66	1	3.18	31%	100%	31%
67	0	0.44	0%	100%	0%
68	0	0.00	N/A	100%	N/A
69	0	0.00	N/A	100%	N/A
70+	1	1.26	79%	100%	79%
Total	101	121.53	83%		

Retirement (continued)**2000-2001 Retirements**

Age	Actual	Expected	Actual/ Expected	Expected Percent	Actual Percent
50	2	2.21	90%	2%	2%
51	1	1.91	52%	2%	1%
52	3	1.80	167%	2%	3%
53	2	1.88	106%	2%	2%
54	6	17.14	35%	20%	7%
55	35	35.08	100%	60%	60%
56	0	4.20	0%	20%	0%
57	3	4.16	72%	20%	14%
58	1	3.43	29%	20%	6%
59	1	2.97	34%	20%	7%
60	2	2.99	67%	20%	13%
61	0	1.15	0%	20%	0%
62	0	4.06	0%	50%	0%
63	3	4.31	70%	50%	35%
64	0	1.87	0%	50%	0%
65	3	6.27	48%	100%	48%
66	0	0.88	0%	100%	0%
67	0	0.00	N/A	100%	N/A
68	0	0.00	N/A	100%	N/A
69	0	0.00	N/A	100%	N/A
70+	0	1.00	0%	100%	0%
Total	62	97.29	64%		

Retirement (continued)**1999-2000 Retirements**

Age	Actual	Expected	Actual/ Expected	Expected Percent	Actual Percent
50	2	1.80	111%	2%	2%
51	5	1.77	283%	2%	6%
52	6	1.99	302%	2%	6%
53	10	1.75	573%	2%	12%
54	3	11.35	26%	20%	5%
55	27	30.82	88%	60%	53%
56	1	3.82	26%	20%	5%
57	1	2.84	35%	20%	7%
58	3	3.08	97%	20%	20%
59	3	3.37	89%	20%	18%
60	1	1.68	60%	20%	12%
61	3	2.31	130%	20%	26%
62	3	5.16	58%	50%	29%
63	3	3.62	83%	50%	41%
64	2	3.69	54%	50%	27%
65	2	3.37	59%	100%	59%
66	1	1.00	100%	100%	100%
67	0	0.00	N/A	100%	N/A
68	0	0.00	N/A	100%	N/A
69	0	0.41	0%	100%	0%
70+	1	1.74	57%	100%	58%
Total	77	85.56	90%		

Retirement (continued)**1998-1999 Retirements**

Age	Actual	Expected	Actual/ Expected	Expected Percent	Actual Percent
50	0	1.74	0%	2%	0%
51	1	1.95	51%	2%	1%
52	2	1.74	115%	2%	2%
53	3	1.17	257%	2%	5%
54	5	10.73	47%	20%	9%
55	31	30.53	102%	60%	61%
56	0	2.72	0%	20%	0%
57	0	1.92	0%	20%	0%
58	1	3.35	30%	20%	6%
59	1	1.75	57%	20%	11%
60	0	2.41	0%	20%	0%
61	2	2.35	85%	20%	17%
62	3	6.13	49%	50%	25%
63	2	4.64	43%	50%	22%
64	2	3.26	61%	50%	31%
65	4	4.86	82%	100%	82%
66	0	0.18	0%	100%	0%
67	0	0.00	N/A	100%	N/A
68	0	0.41	0%	100%	0%
69	0	1.59	0%	100%	0%
70+	0	0.00	N/A	100%	N/A
Total	57	83.43	68		

Disability

Basis of Analysis

The disability rates specify the assumed probability that a given employee will become disabled within the following year. The Minnesota State Retirement System Correctional Employees Retirement Fund currently uses an age-related disability table.

Historical Data

During the five years from 1998 through 2003, there were more disabilities than expected (66 actual versus 44 expected). Female experience was more than twice than expected.

Disability (continued)

1998-2003 Disabilities

Age	Males			Females			Total		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.12	0%	1	0.12	831%	1	0.24	421%
25-29	0	0.77	0%	2	0.48	415%	0	1.31	0%
30-34	7	1.55	451%	4	0.75	530%	6	2.33	257%
35-39	4	2.37	169%	5	1.18	424%	9	3.48	259%
40-44	3	4.14	72%	3	2.14	140%	11	6.20	177%
45-49	7	6.53	107%	7	3.14	223%	14	9.62	145%
50-54	9	9.74	92%	7	4.40	159%	18	13.89	130%
55-59	4	3.12	128%	3	2.47	121%	4	5.21	77%
60-64	1	1.30	77%	1	1.09	91%	3	2.20	136%
65+	0	0.00	0%	0	0.00	0%	0	0.00	0%
Total	35	29.65	118%	33	15.78	209%	66	44.48	148%

Disability (continued)

2002-2003 Disabilities

Age	Males			Females			Total		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.03	0%	0	0.03	0%	0	0.06	0%
25-29	0	0.15	0%	2	0.09	2197%	2	0.24	844%
30-34	1	0.31	318%	1	0.15	66%	2	0.47	426%
35-39	1	0.50	202%	0	0.25	0%	1	0.74	135%
40-44	0	0.92	0%	0	0.45	0%	0	1.38	0%
45-49	3	1.32	227%	1	0.74	136%	4	2.06	194%
50-54	1	2.13	47%	3	1.03	292%	4	3.16	127%
55-59	1	0.81	123%	1	0.54	185%	2	1.36	147%
60-64	0	0.33	0%	0	0.28	0%	0	0.61	0%
65+	0	0.00	0%	0	0.00	0%	0	0.00	0%
Total	7	6.50	108%	8	3.55	226%	15	10.05	149%

2001-2002 Disabilities

Age	Males			Females			Total		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.03	0%	0	0.03	0%	0	0.06	0%
25-29	0	0.15	0%	0	0.10	0%	0	0.25	0%
30-34	3	0.33	918%	2	0.17	1208%	5	0.49	1015%
35-39	0	0.49	0%	1	0.26	384%	1	0.75	134%
40-44	0	0.89	0%	1	0.48	207%	1	1.37	73%
45-49	2	1.31	152%	2	0.68	294%	4	1.99	201%
50-54	2	2.08	96%	0	0.98	0%	2	3.07	65%
55-59	2	0.73	276%	1	0.55	182%	3	1.28	235%
60-64	1	0.24	413%	0	0.22	0%	1	0.46	218%
65+	0	0.00	0%	0	0.00	0%	0	0.00	0%
Total	10	6.24	160	7	3.47	202%	17	9.71	175%

Disability (continued)

2000-2001 Disabilities

Age	Males			Females			Total		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.03	0%	0	0.03	0%	0	0.06	0%
25-29	0	0.16	0%	0	0.11	0%	0	0.27	0%
30-34	0	0.33	0%	1	0.17	594%	1	0.49	202%
35-39	1	0.47	211%	0	0.24	0%	1	0.71	141%
40-44	2	0.87	229%	1	0.46	219%	3	1.33	226%
45-49	2	1.34	150%	2	0.66	302%	4	2.00	200%
50-54	3	2.03	148%	1	0.96	105%	4	2.99	134%
55-59	1	0.64	157%	0	0.49	0%	1	1.13	89%
60-64	0	0.21	0%	1	0.23	442%	1	0.43	231%
65+	0	0.00	0%	0	0.00	0%	0	0.00	0%
Total	9	6.08	148%	6	3.33	180%	15	9.41	159%

1999-2000 Disabilities

Age	Males			Females			Total		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.02	0%	0	0.02	0%	0	0.04	0%
25-29	0	0.16	0%	0	0.10	0%	0	0.26	0%
30-34	3	0.30	996%	0	0.14	0%	3	0.44	678%
35-39	2	0.46	434%	2	0.22	907%	4	0.68	587%
40-44	0	0.75	0%	1	0.40	250%	1	1.15	87%
45-49	0	1.31	0%	1	0.58	172%	1	1.89	53%
50-54	1	1.83	55%	2	0.74	271%	3	2.57	117%
55-59	0	0.53	0%	1	0.48	206%	1	1.02	99%
60-64	0	0.23	0%	0	0.16	0%	0	0.39	0%
65+	0	0.00	0%	0	0.00	0%	0	0.00	0%
Total	6	5.60	107%	7	2.85	246%	13	8.45	154%

Disability (continued)

1998-1999 Disabilities

Age	Males			Females			Total		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.02	0%	1	0.02	6488%	1	0.03	3251%
25-29	0	0.16	0%	0	0.08	0%	0	0.24	0%
30-34	0	0.28	0%	0	0.13	0%	0	0.41	0%
35-39	0	0.45	0%	2	0.22	927%	2	0.67	299%
40-44	1	0.71	141%	0	0.36	0%	1	1.06	94%
45-49	0	1.25	0%	1	0.48	208%	1	1.73	58%
50-54	2	1.66	120%	1	0.69	145%	3	2.35	128%
55-59	0	0.41	0%	0	0.40	0%	0	0.81	0%
60-64	0	0.29	0%	0	0.21	0%	0	0.51	0%
65+	0	0.00	0%	0	0.00	0%	0	0.00	0%
Total	3	5.23	57%	5	2.58	194%	8	7.81	102%

Active Mortality**Basis of Analysis**

The active mortality rates specify the assumed probability that a given employee will die in the following year. Currently, the Minnesota State Retirement System Correctional Employees Retirement Fund uses the 1983 Group Annuity Table with a one year set back for males and with no set back for females.

Historical Data

During the five years from 1998 through 2003, the number of actual deaths was significantly less than expected. Unfortunately, this small sampling does not represent enough data to make a reasonable analysis of mortality rates. Using standard mortality tables usually represents the best estimate for future experience over the long term.

Because the sample group is small, results for the five-year period are shown in the aggregate.

Active Mortality (continued)

1998-2003 Active Mortality

Age	Male			Female		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.06	0%	0	0.03	0%
25-29	0	0.46	0%	0	0.16	0%
30-34	0	1.00	0%	0	0.27	0%
35-39	1	1.51	66%	0	0.42	0%
40-44	1	2.51	40%	0	0.68	0%
45-49	1	4.31	23%	0	0.96	0%
50-54	1	6.34	16%	0	1.24	0%
55-59	1	1.83	55%	0	0.64	0%
60-64	2	1.14	175%	0	0.45	0%
65+	0	0.26	0%	0	0.10	0%
Total	7	19.42	36%	0	4.95	0%

Retiree and Beneficiary Mortality**Basis of Analysis**

The post-retirement mortality rates specify the assumed probability that a given retiree or beneficiary will die in the following year. Currently, the Minnesota State Retirement State Correctional Employees Retirement Fund uses the 1983 Group Annuity Mortality Table set forward two years for post-retirement mortality for both males and females.

Historical Data

During the five years from 1998 through 2003, actual deaths were consistently less than the expected number for male annuitants (81 actual versus 92 expected) and slightly more than the expected number for female annuitants (19 actual versus 17 expected).

Retiree and Beneficiary Mortality (continued)

1998-2003 Retiree Mortality

Age	Male			Female		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.00	N/A	0	0.00	N/A
25-29	0	0.00	N/A	0	0.00	N/A
30-34	0	0.00	N/A	0	0.00	N/A
35-39	0	0.00	N/A	0	0.00	N/A
40-44	0	0.01	0%	0	0.01	0%
45-49	0	0.00	N/A	0	0.02	0%
50-54	1	0.79	127%	1	0.17	591%
55-59	6	5.80	103%	2	0.93	215%
60-64	5	6.95	72%	2	1.26	158%
65-69	10	10.49	95%	1	1.67	60%
70-74	13	12.66	103%	1	1.87	53%
75-79	16	17.42	92%	1	2.13	47%
80-84	14	17.58	80%	4	3.44	116%
85-89	14	16.86	83%	6	4.36	138%
90-94	2	3.21	62%	1	0.70	143%
95-99	0	0.00	N/A	0	0.00	N/A
100+	0	0.00	N/A	0	0.00	N/A
Total	81	91.78	88%	19	16.58	115%

Retiree and Beneficiary Mortality (continued)

2002-2003 Retiree Mortality

Age	Male			Female		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.00	N/A	0	0.00	N/A
25-29	0	0.00	N/A	0	0.00	N/A
30-34	0	0.00	N/A	0	0.00	N/A
35-39	0	0.00	N/A	0	0.00	N/A
40-44	0	0.00	N/A	0	0.00	N/A
45-49	0	0.00	N/A	0	0.01	0%
50-54	0	0.19	0%	1	0.05	2,000%
55-59	1	1.61	62%	1	0.30	337%
60-64	1	1.59	63%	1	0.30	338%
65-69	2	2.56	78%	0	0.42	0%
70-74	3	2.52	119%	0	0.57	0%
75-79	1	3.51	28%	0	0.42	0%
80-84	2	3.51	57%	0	0.44	0%
85-89	0	3.39	0%	1	0.80	125%
90-94	0	0.93	0%	1	0.47	213%
95-99	0	0.00	N/A	0	0.00	N/A
100+	0	0.00	N/A	0	0.00	N/A
Total	10	19.83	50%	5	3.77	133%

Retiree and Beneficiary Mortality (continued)

2001-2002 Retiree Mortality

Age	Male			Female		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.00	N/A	0	0.00	N/A
25-29	0	0.00	N/A	0	0.00	N/A
30-34	0	0.00	N/A	0	0.00	N/A
35-39	0	0.00	N/A	0	0.00	N/A
40-44	0	0.00	N/A	0	0.00	N/A
45-49	0	0.00	N/A	0	0.00	N/A
50-54	0	0.19	0%	0	0.04	0%
55-59	2	1.36	147%	0	0.23	0%
60-64	0	1.42	0%	0	0.27	0%
65-69	1	2.22	45%	0	0.43	0%
70-74	3	2.48	121%	0	0.43	0%
75-79	3	3.33	90%	0	0.43	0%
80-84	1	3.60	28%	2	0.71	282%
85-89	2	3.20	63%	2	0.88	227%
90-94	2	1.11	181%	0	0.19	0%
95-99	0	0.00	N/A	0	0.00	N/A
100+	0	0.00	N/A	0	0.00	N/A
Total	14	18.91	74%	4	3.62	110%

Retiree and Beneficiary Mortality (continued)

2000-2001 Retiree Mortality

Age	Male			Female		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.00	N/A	0	0.00	N/A
25-29	0	0.00	N/A	0	0.00	N/A
30-34	0	0.00	N/A	0	0.00	N/A
35-39	0	0.00	N/A	0	0.00	N/A
40-44	0	0.00	N/A	0	0.00	N/A
45-49	0	0.00	N/A	0	0.00	N/A
50-54	1	0.20	508%	0	0.03	0%
55-59	0	1.10	0%	1	0.18	565%
60-64	0	1.34	0%	1	0.28	352%
65-69	4	2.07	193%	1	0.33	303%
70-74	5	2.54	197%	0	0.33	0%
75-79	6	3.59	167%	1	0.47	212%
80-84	3	3.53	85%	1	0.77	129%
85-89	4	3.41	117%	2	0.99	202%
90-94	0	0.64	0%	0	0.05	0%
95-99	0	0.00	N/A	0	0.00	N/A
100+	0	0.00	N/A	0	0.00	N/A
Total	23	18.41	125%	7	3.44	204%

Retiree and Beneficiary Mortality (continued)

1999-2000 Retiree Mortality

Age	Male			Female		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.00	N/A	0	0.00	N/A
25-29	0	0.00	N/A	0	0.00	N/A
30-34	0	0.00	N/A	0	0.00	N/A
35-39	0	0.00	N/A	0	0.00	N/A
40-44	0	0.00	N/A	0	0.00	N/A
45-49	0	0.00	N/A	0	0.00	N/A
50-54	0	0.13	0%	0	0.03	0%
55-59	2	0.93	214%	0	0.12	0%
60-64	1	1.28	78%	0	0.25	0%
65-69	2	1.94	103%	0	0.24	0%
70-74	1	2.50	40%	0	0.28	0%
75-79	1	3.44	29%	0	0.43	0%
80-84	2	3.18	63%	1	0.80	125%
85-89	5	3.74	134%	1	0.92	109%
90-94	0	0.38	0%	0	0.00	N/A
95-99	0	0.00	N/A	0	0.00	N/A
100+	0	0.00	N/A	0	0.00	N/A
Total	14	17.52	80%	2	3.07	65%

Retiree and Beneficiary Mortality (continued)

1998-1999 Retiree Mortality

Age	Male			Female		
	Actual	Expected	Actual/ Expected	Actual	Expected	Actual/ Expected
20-24	0	0.00	N/A	0	0.00	N/A
25-29	0	0.00	N/A	0	0.00	N/A
30-34	0	0.00	N/A	0	0.00	N/A
35-39	0	0.00	N/A	0	0.00	N/A
40-44	0	0.00	N/A	0	0.00	N/A
45-49	0	0.00	N/A	0	0.00	N/A
50-54	0	0.07	0%	0	0.02	0%
55-59	1	0.80	125%	0	0.10	0%
60-64	3	1.33	225%	0	0.17	0%
65-69	1	1.71	59%	0	0.26	0%
70-74	1	2.63	38%	1	0.27	370%
75-79	5	3.54	141%	0	0.38	0%
80-84	6	3.76	160%	0	0.71	0%
85-89	3	3.12	96%	0	0.77	0%
90-94	0	0.15	0%	0	0.00	N/A
95-99	0	0.00	N/A	0	0.00	N/A
100+	0	0.00	N/A	0	0.00	N/A
Total	20	17.11	117%	1	2.68	37%

Disability Retiree Mortality

Basis of Analysis

The post-disability mortality rates specify the assumed probability that a given disability retiree will die in the following year. Currently, the Minnesota State Retirement System State Patrol Plan uses the Combined Annuity Mortality table for post-disability mortality.

Historical Data

During the five years from 1998 through 2003, the actual number of disability retiree deaths was about as expected (5 actual versus 6 expected). As with the active mortality, not enough data exists to perform a meaningful analysis.

Because the sample group is small, results for the five-year period are shown in the aggregate.

Disability Retiree Mortality (continued)

1998-2003 Disability Retiree Mortality

Age	Actual	Expected	Actual/ Expected
20-24	0	0.00	N/A
25-29	0	0.01	0%
30-34	0	0.06	0%
35-39	1	0.19	526%
40-44	0	0.28	0%
45-49	2	0.64	313%
50-54	1	1.40	71%
55-59	1	1.17	85%
60-64	0	0.58	0%
65-69	0	0.34	0%
70-74	0	0.01	0%
75-79	0	0.59	0%
80-84	0	0.42	0%
85-89	0	0.00	N/A
90-94	0	0.00	N/A
95-99	0	0.00	N/A
100+	0	0.00	N/A
Total	5	5.69	88%

Salary Scale

Basis of Analysis

Salary increases are derived from three sources:

- Inflation
- General productivity
- Merit and promotion increases

For any given year, the correlation of salary increases with inflation is seldom perfect. However, over several years, especially with consistent inflation during those years, salary increases usually show a fairly clear inflation component, normally with a slight lag between inflation and salary growth. Merit and promotion increases are usually inversely correlated with age. That is, average salary increases are usually higher as a percentage for younger employees in most groups.

Currently, for the Correctional Employees Retirement Fund, an age-related salary increase assumption with rates ranging from 7.75% at age 20 to 5.25% at ages 55 and higher is used.

Historical Data

We reviewed the salary data by both age and service. The first table on the next page shows, by five-year age groups, the average salary increase over the entire study period and the average salary increase for each year in the study period. The table also shows the total average salary increase for each year in the experience study. As expected, higher increases occur at the younger ages. Actual salary increases were less than assumed during the five year period.

The second table shows the salary experience by service groups. Generally, salary increases decreased as service increased, and stabilized after 10 years of service.

For the salary analysis, we excluded members whose pay increased or decreased 20% or more. While this was a relatively small group, their salary increases distorted the experience of the overall group of continuing active participants.

Salary Scale by Age

Average Salary Increases											
Years	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
1998-1999	6.5%	5.2%	4.8%	5.0%	4.1%	4.8%	4.9%	6.6%	4.0%	3.5%	4.8%
1999-2000	13.3%	9.5%	10.6%	10.6%	9.0%	8.7%	8.6%	8.3%	7.0%	6.5%	9.4%
2000-2001	3.3%	0.2%	-0.2%	-1.1%	-0.3%	0.3%	0.3%	-0.3%	0.5%	-1.7%	-0.1%
2001-2002	5.7%	6.6%	4.4%	4.1%	3.3%	2.8%	2.8%	3.9%	4.5%	3.2%	3.7%
2002-2003	5.2%	5.4%	5.8%	5.0%	5.1%	4.8%	5.1%	5.4%	5.6%	0.0%	5.1%
All Years	6.7%	5.3%	5.0%	4.7%	4.2%	4.3%	4.3%	4.7%	4.3%	2.3%	4.5%
Expected	7.2%	7.0%	7.0%	6.8%	6.2%	5.6%	5.4%	5.3%	5.3%	5.3%	
Difference	(0.5%)	(1.7%)	(2.0%)	(2.1%)	(2.0%)	(1.3%)	(1.1%)	(0.6%)	(1.0%)	(3.0%)	

Salary Scale by Service

Average Salary Increases										
Years	<2	3	4	5-9	10-14	15-19	20-24	25-29	30+	
1998-1999	7.1%	5.8%	4.0%	4.7%	4.3%	4.7%	4.7%	5.8%	3.0%	
1999-2000	10.6%	10.0%	9.7%	10.1%	8.7%	8.3%	8.3%	7.9%	6.8%	
2000-2001	1.9%	1.5%	(0.3%)	(0.6%)	(0.9%)	(0.1%)	(0.2%)	0.4%	0.4%	
2001-2002	5.6%	3.8%	4.5%	3.9%	2.8%	2.8%	2.7%	3.0%	1.6%	
2002-2003	3.4%	11.5%	11.8%	10.9%	10.8%	10.3%	10.4%	10.1%	9.2%	
All Years	5.7%	6.4%	5.9%	5.7%	5.1%	5.1%	5.1%	5.4%	4.2%	
Expected	7.0%	7.0%	7.0%	7.0%	6.2%	5.6%	5.5%	5.4%	5.4%	
Difference	(1.3%)	(0.6%)	(1.1%)	(1.3%)	(1.1%)	(0.5%)	(0.4%)	0.0%	(1.2%)	

Investment Return

Basis of Analysis

The investment return assumption for funding is set to reflect long-term asset performance. It is based upon anticipated earnings on funds needed to provide all projected future benefits for current members, including future contributions.

Consistency and reasonableness between the investment return and salary scale assumption are important to produce valid costs. The inflation component of each assumption should be consistent. The investment return assumption consists of the inflation component and a real rate of return.

Currently, the Minnesota State Retirement System Correctional Employees Retirement Fund uses an 8.50% investment return assumption.

Historical Data and Analysis

Returns in excess of the 8.50% target were achieved in fiscal years ending June 30, 1999 and 2000, but fell short in the following three years. The average return over the 5-year period was just over 1%.

To evaluate the investment return assumptions, we must consider forecasted inflation as well as forecasted real rates of return on assets. Mercer investment consultants forecast these values on a regular basis reflecting the latest thinking on the economy and the outlook for capital markets.

Using Mercer investment assumptions and model for calculating portfolio returns and the target asset allocation on the next page, we feel the plan can substantiate an investment return between 5.5% and 9.25% with the expected return about 7.45%. Mercer's best practice is to choose the most appropriate assumption that falls between the 25th and 75th percentile. Choosing a rate too close to the edge of the range can result in the need to change the assumption too frequently, causing volatility in pension contribution results. The current 8.5% investment return assumption is at the 65th percentile.

Percentile	Active Fund	MPRIF	Total
25th	5.58%	5.63%	5.60%
50th	7.37%	7.52%	7.45%
75th	9.17%	9.42%	9.30%

On the following page, the target asset allocations for the active and post funds are shown.

Investment Return

Target Asset Allocations		
	Active Fund	MPRIF
Domestic Stocks	45%	50%
International Stocks	15%	15%
Bonds	24%	27%
Alternative Assets*	15%	5%
Cash	<u>1%</u>	<u>3%</u>
	100%	100%

* Alternative assets include real estate, venture capital, and resource (oil, gas, etc.) funds.

Summary of Observations

The following summarizes the results of the experience study covering the period from July 1, 1998 through June 30, 2003 and indicates where assumption changes will be considered:

Withdrawal

Actual withdrawals were 51% of expected, although for members with more than three years of experience, actual withdrawals were 35% of expected. The rates should be adjusted to better reflect actual experience.

Retirement

Current retirement rates overestimated the number of retirements and did not properly anticipate the number of early retirements. Rates should be updated to better reflect actual experience.

Disability

The actual number of disability retirements was greater than assumed. Rates should be updated to reflect actual experience.

Active and Disability Retiree Mortality

The sample group is not large enough to perform a meaningful analysis. Standard mortality tables represent the most likely probabilities.

Retiree and Beneficiary Mortality

Actual deaths were less than expected for males and were slightly greater than expected for females. Mortality rates should be updated to reflect actual experience.

Salary Scale and Investment Return

Actual salary increases were lower than assumed. Rates should be adjusted to better fit actual experience.

The current investment return assumption of 8.50% falls within a reasonable range. However, it would be appropriate to jointly review the economic assumptions, particularly the inflation component.

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