

TO:	Members of the Legislative Commission on Pensions and Retirement
FROM:	Ed Burek, Deputy Director
RE:	Proposal to Revise Minnesota State Retirement System Correctional Plan Actuarial Assumptions (Withdrawal Rates, Retirement Age Pattern, Mortality, Disability)
DATE:	December 2, 2005

Introduction

During the 2005 Legislative Session, S.F. 997 (Betzold-by request); H.F. 1753 (Wardlow) was introduced, which would increase the employee and employer contribution rates for the Correctional State Employees Retirement Plan of the Minnesota State Retirement System (MSRS-Correctional). The increases would occur in four steps, with full phase-in occurring on July 1, 2008. The bill was heard by the Legislative Commission on Pensions and Retirement on May 12, 2005, but no final action was taken. The bill presumably stems from a Correctional Plan experience study by the MSRS actuary. Based on that study, the MSRS actuary is recommending changes in a few demographic actuarial assumptions (termination or withdrawal rates, the retirement age pattern, pre-retirement and post-retirement mortality, and disability). If given Commission approval, these changes will increase computed plan liabilities and normal cost.

The issue currently before the Commission is whether to approve these demographic actuarial assumption changes. Changing demographic assumptions does not require amending law. Only economic assumptions, such as those for pension fund rate of return and membership salary increase assumptions are specified in law, found in Minnesota Statutes, Section 356.215, with some additional provisions in Section 356.216 for local police and paid fire plans. However, revised demographic assumptions can not be used in an official plan actuarial valuation unless the changes are approved by the Commission (Section 356.215, Subdivision 18).

The actuarial valuation process is intended to provide policymakers and others with an accurate picture of the funded condition and financial requirements of a public pension plan, which is not possible if the actuarial valuation relies on obsolete or otherwise inadequate assumptions. Erroneous assumptions could serve only to mislead policy makers about the true financial status of a plan. If actuarial assumptions lead to an understatement of true plan costs, future problems are created because the Legislature will not be aware, in a timely manner, of a need to increase contributions to properly fund the plan. The longer the problem goes unrecognized, the more expensive it will be to address. On the other hand, if actuarial assumptions lead to overstatement of plan costs and contribution rates are increased accordingly, more funding will flow to a plan than is needed, creating an unnecessary burden on taxpayers and creating pressure in the future to provide a benefit improvement. Therefore, it is important that the Commission takes care in reviewing experience studies to ensure that current assumptions are reasonable. If changes are recommended, the Commission needs to consider whether a change is sufficiently justified and whether the specific proposal is the best alternative, given the implications of the experience study results coupled with sound professional opinion.

The Commission no longer retains its own actuary, due to a 2004 law change caused in part by an appropriations reduction to the Commission. To provide the official valuations and other services, the seven largest retirement system administrators jointly must retain an actuary, with ratification of the choice by the Commission. The actuarial firm the directors selected as the joint actuary was the Segal Company.

A consequence of this 2004 law change is that the Commission is in a weakened position when it must consider actuarial matters. Thomas K. Custis of Milliman USA, the actuarial firm that the Commission had retained, was able to provide some review of the current assumption change proposal shortly before termination of the Commission's contract with that firm. In future reviews, the Commission will not have that guidance.

Overview Comments on MSRS-Correction Plan Experience Study: Problem of Sample Size

The 2004 MSRS-Correctional Plan experience study, covering 1998 through 2003, was provided by the MSRS actuary, Mercer Human Resources Consulting (Mercer), rather than by the Segal Company, the jointly-retained actuary, or Milliman USA, the Commission's actuary during the time period covered by this study. Unfortunately, because of the small size of this plan (approximately 3,300 active members and

somewhat over 1,000 retirees and survivors), it is often difficult to draw conclusions with confidence. For instance, for the group as a whole the data may indicate fewer occurrences than expected under the current assumptions, but often there is just not enough information to provide any meaningful results for the various age cohorts within the plan membership. This is particularly an issue with the review of retirement age, mortality, and disability assumptions. At times it is not clear if there is sufficient information to justify changing the assumptions. When the actuary does recommend changes, the extent of the change being proposed seems based more on the actuary's professional judgment than upon the specific results from the plan's data.

In contrast, the General State Employees Retirement Plan of the Minnesota State Retirement System (MSRS-General), which covers most state employees, has about 48,000 active members. In a plan that large, in an experience study there would be many more observations of any assumption under review, creating far more faith that the observed results are meaningful. With the MSRS-Correctional Plan, there are zero observations, or only a few, for some age groups. Results can be significantly altered by a single random event. Because of this problem, at times the actuaries recommend that MSRS-Correctional should use the same actuarial assumption as MSRS-General because there are too few events to conclude that MSRS-Correctional differs from MSRS-General in the underlying demographic assumptions. Under these circumstances, that is a reasonable conclusion.

Recent Experience Study Results; Review by Actuaries

- a. <u>Summary</u>. In the MSRS-Correctional experience study, Mercer commented on four problem areas, as follows:
 - 1. <u>Withdrawal</u>. Although the current assumptions already assume low turnover compared to a general employee plan, actual turnover for members who had three or more years of service was about half the predicted numbers. In contrast, those with less than three years of service had more terminations than expected.
 - 2. <u>Retirement</u>. The assumed retirements at age 55, the normal retirement age for this fund, fit reasonably well, but early retirements are considerably more than predicted for ages 50 to 53, and fewer retirements are occurring after age 55 than predicted.
 - 3. <u>Mortality</u>. Active member mortality provided too small a sample size to be meaningful. There were fewer deaths for retired males than expected and slightly higher than expected death rates for the females.
 - 4. <u>Disability</u>. Disabilities are occurring at far higher rates than predicted.
 - 5. <u>Salary Scale</u>. Actual salary increases are less than expected.

Mercer developed specific recommendations to reduce the assumed withdrawal (termination) assumptions and to use different rates during the first three years of employment, to revise retirement age assumptions, to strengthen the pre- and post-retirement mortality assumptions, and to revise disability assumptions to assume considerably more disability for males than currently assumed, and to double the assumed female disability rates. Although the actuary noted that salary increases were less than assumed, the actuary declined to recommend any new assumptions in that area.

The proposed changes were reviewed in June 2004 by Thomas Custis, consulting actuary for Milliman USA, which at that time was the actuarial firm retained by the Commission. He supported the suggested changes in the withdrawal, retirement, and disability assumptions, but he questioned the specific proposed retiree mortality assumptions. Under the initial Mercer mortality proposal, MSRS-Correctional Plan retirees were assumed to live shorter lives than MSRS-General Plan retirees. Since there is little theoretical reason to suggest that MSRS-Correctional Plan retirees should have different mortality experience than General Plan members, Mr. Custis suggested that the MSRS-Correctional Plan mortality recommendations, for both active and retired lives, be revised to match the assumptions used for MSRS-General. Mercer accepted that suggestion by Mr. Custis.

The experience study results for withdrawal, retirement age, mortality, and disability are discussed in more detail below.

b. <u>Withdrawal</u>. Withdrawal, also called turnover, separation, or termination generally acts to reduce plan costs because, at least for those who terminate with little service, the best option is to take a refund. The refund includes employee contributions plus six percent interest. The remaining investment earnings on those contributions, plus the employer contributions and all investment earnings on those contributions, stay in the fund and are used to finance benefits for those who remain.

Termination results from the study are shown in Table 1 below. Because terminations tend to be greater among individuals with short service than for those of the same age who already have longer service, the actuary chose to present separate results for those individuals with less than three years of service, and those with three or more years. The actuary also presented separate results for males and females, although those results are not broken down into less-than-three-year, three-years-or-more groups.

The actuary concluded that terminations by those with less than three years service was more than expected, since for this "less-than-three-year" group as a whole, actual terminations were 112 percent of expected terminations. For those with three-or-more years of service, actual terminations were only 35 percent of expected. Viewing males and females separately in the lower portion of the table, each had actual turnover that was only about half of the expected amount (50 percent for males, and 52 percent for females), but that presentation mixes those that have less than three years of service with those who have three or more. Presumably, for both males and females with three or more years of service, the ratio of actual to expected terminations is probably closer to 35 percent than it is to 50 percent.

Table 11998-2003 TerminationsMSRS-Correctional

	Less Than 3 Years			3+ Years		Total			
			Actual/			Actual/			Actual/
Age	Actual	Expected	Expected	Actual	Expected	Expected	Actual	Expected	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%

		Males		Females			Total		
			Actual/			Actual/			Actual/
Age	Actual	Expected	Expected	Actual	Expected	Expected	Actual	Expected	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%

Source: "Experience Study, 1998-2003, Minnesota State Retirement System, Correctional Plan", Mercer Human Resources Consulting, June 2004

These turnover results lead the actuary to recommend revised turnover assumptions. Table 2 below provides the current turnover assumptions and the proposed new ones. The proposed probabilities of turnover for those with three or more years of service will be half that previously assumed. Fewer turnovers will increase plan contribution rate requirements considerably. (A later table summarizing expected cost impacts of all the actuarial assumption changes indicates that the revised turnover assumption is the largest single contributor to the total increase in required contributions.) However, if the Commission is convinced that a change is needed, based on a review of the material here and testimony from MSRS or its actuary, the Commission may ask whether the proposed change is enough. Table 1 suggested that for employees with three or more years of employment, actual withdrawals were about one-third of those currently expected, not one-half.

The turnover assumption in Table 2 for each age is expressed as the number of terminations in an assumed population of 10,000. Alternatively, these could be expressed as percentages. For example, at age 20 under the proposed assumptions it is expected that for males there will be 1,200 terminations during the year per 10,000 assumed employees in that age group or, alternatively, the assumed probability that a male worker aged 20 will terminate during the year is 12 percent. At age 25, there

are expected to be 735 terminations per 10,000 assumed male employees, or a 7.35 percent probability of terminating. At age 35, the probability of terminating is 3.0 percent. These probabilities decrease with age.

During the first three years of employment for any given employee, the probabilities reflected in the table will not be used. Instead, the assumed probability of terminating will be 10.0 percent in each of those first three years, or 1,000 terminations per 10,000 individuals.

Table 2Turnover (Separation) AssumptionsCurrent and Proposed RatesEmployees with Three or More Years of EmploymentMSRS-Correctional

	Current Assumption Per 10,000		Current Assumption		Proposed Assumption* Per 10,000		Proposed Assumption	
	Occu	irrences	Percei	ntages	Occu	rrences	Percer	itages
Age	Male	Female	Male	Female	Male	Female	Male	Female
20	2,400	1,600	24.0%	16.0%	1,200	800	12.0%	8.00%
21	2,200	1,560	22.0%	15.6%	1,100	780	11.0%	7.80%
22	2,000	1,520	20.0%	15.2%	1,000	760	10.0%	7.60%
23	1,810	1,480	18.1%	14.8%	905	740	9.05%	7.40%
24	1,630	1,450	16.3%	14.5%	815	725	8.15%	7.25%
25	1,470	1,420	14.7%	14.2%	735	710	7.35%	7.10%
26	1,330	1,400	13.3%	14.0%	665	700	6.65%	7.00%
27	1,210	1,380	12.1%	13.8%	605	690	6.05%	6.90%
28	1,100	1,370	11.0%	13.7%	550	685	5.50%	6.85%
29	1,000	1,360	10.0%	13.6%	500	680	5.00%	6.80%
30	910	1,350	9.1%	13.5%	455	675	4.55%	6.75%
31	830	1,340	8.3%	13.4%	415	670	4.15%	6.70%
32	760	1,330	7.6%	13.3%	380	665	3.80%	6.65%
33	700	1,320	7.0%	13.2%	350	660	3.50%	6.60%
34	650	1,310	6.5%	13.1%	325	655	3.25%	6.55%
35	600	1,290	6.0%	12.7%	300	645	3.00%	6.45%
36	560	1,260	5.6%	12.6%	280	630	2.80%	6.30%
37	520	1,220	5.2%	12.2%	260	610	2.60%	6.10%
38	490	1,170	4.9%	11.7%	245	585	2.45%	5.85%
39	460	1,110	4.6%	11.1%	230	555	2.30%	5.55%
40	440	1,040	4.4%	10.4%	220	520	2.20%	5.20%
41	420	960	4.2%	9.6%	210	480	2.10%	4.80%
42	400	870	4.0%	8.7%	200	435	2.0%	4.35%
43	380	780	3.8%	7.8%	190	390	1.9%	3.90%
44	360	700	3.6%	7.0%	180	350	1.8%	3.50%
45	340	640	3.4%	6.4%	170	320	1.7%	3.20%
46	320	590	3.2%	5.9%	160	295	1.6%	2.95%
47	300	560	3.0%	5.6%	150	280	1.5%	2.80%
48	280	530	2.8%	5.3%	140	265	1.4%	2.65%
49	260	500	2.6%	5.0%	130	250	1.3%	2.50%
50	240	470	2.4%	4.7%	120	235	1.2%	2.35%
51	220	440	2.2%	4.4%	110	220	1.1%	2.20%
52	200	410	2.0%	4.1%	100	205	1.0%	2.05%
53	180	390	1.8%	3.9%	90	195	0.90%	1.95%
54	160	360	1.6%	3.6%	80	180	0.80%	1.80%
55	140	330	1.4%	3.3%	70	165	0.70%	1.65%
56	120	290	1.2%	2.9%	60	145	0.60%	1.45%
57	100	230	1.0%	2.3%	50	115	0.50%	1.15%
58	70	170	0.7%	1.7%	35	85	0.35%	0.85%
59	40	90	0.4%	0.9%	20	45	0.20%	0.45%
60+	0	0	0	0	0	0	0	0

* Age-related rates apply after the three-year select period. During the first three years of employment, the rate is 1,000 per 10,000 occurrences or ten percent.

c. <u>Retirement Age Assumptions</u>. Table 3 displays the actual retirements that occurred by age, the expected retirements by age, and the actual/expected ratios. Normal retirement age for the plan is age 55; individuals may continue in covered employment beyond that age pending medical certification that the individual is fit to continue duties. Individuals may retire as early as age 50, but with a reduction in benefits.

The results indicate that more employees than expected are retiring early, except at age 54, where the actual/expected ratio was only 28 percent. The assumption for age 55 seems quite accurate. Beyond

age 55, retirements at each age are considerably fewer than expected. Although this a quasi-public safety plan with a presumed need to out-transition individuals at an early age due to the rigors of the employment, some individuals are continuing in covered employment until their late 60s, and in some cases, into their 70s.

Table 31998-2003 RetirementsMSRS-Correctional

				Expecte	
	Actua	Expecte	Actual/	d	Actual
Age	1	d	Expected	Percent	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%		

Source: "Experience Study, 1998-2003, Minnesota State Retirement System, Correctional Plan", Mercer Human Resources Consulting, June 2004

Table 4 displays the proposed change in retirement assumptions, again in the form of occurrences per 10,000. The proposed assumptions would increase expected retirements prior to age 55, except for a decrease in expected retirements at age 54, and would decrease expected retirements after age 55. The current assumption at age 65, that no individuals will remain after that age, is retained.

Table 4Retirement Age AssumptionsCurrent and Proposed RatesMSRS-Correctional

	Current A	Assumption	Curr	ent	Proposed	Assumption		
	Per	10,000	Assum	ption	Per	10,000	Proposed A	ssumption
	Occu	irrences	Percen	tages	Occu	rrences	Percei	ntages
Age	Male	Female	Male	Female	Male	Female	Male	Female
50	200	200	2.0%	2.0%	500	500	5.0%	5.0%
51	200	200	2.0%	2.0%	500	500	5.0%	5.0%
52	200	200	2.0%	2.0%	500	500	5.0%	5.0%
53	200	200	2.0%	2.0%	500	500	5.0%	5.0%
54	2,000	2,000	20.0%	20.0%	500	500	5.0%	5.0%
55	6,000	6,000	60.0%	60.0%	6,000	6,000	60.0%	60.0%
56	2,000	2,000	20.0%	20.0%	1,000	1,000	10.0%	10.0%
57	2,000	2,000	20.0%	20.0%	1,000	1,000	10.0%	10.0%
58	2,000	2,000	20.0%	20.0%	1,000	1,000	10.0%	10.0%
59	2,000	2,000	20.0%	20.0%	1,000	1,000	10.0%	10.0%
60	2,000	2,000	20.0%	20.0%	1,000	1,000	10.0%	10.0%
61	2,000	2,000	20.0%	20.0%	1,000	1,000	10.0%	10.0%
62	5,000	5,000	50.0%	50.0%	2,500	2,500	25.0%	25.0%
63	5,000	5,000	50.0%	50.0%	2,500	2,500	25.0%	25.0%
64	5,000	5,000	50.0%	50.0%	2,500	2,500	25.0%	25.0%
65	10,000	10,000	100.0%	100.0%	10,000	10,000	100.0%	100.0%
66+	0	0	0	0	0	0	0	0

d. <u>Mortality Assumptions</u>. Table 5 displays the active member mortality results. This is an area where the effect of the plan's small size is most noticeable. In the experience study the actuary wrote: "Unfortunately, this small sampling does not represent enough data to make a reasonable analysis of mortality rates." Only seven deaths occurred during the 1998-2003 period, and all were male. The very small number of expected and actual deaths makes it impossible to obtain actual/expected ratios of about one. In some age groups only a fraction of one death was expected given the size of the population at risk, and no deaths occurred in those age groups. No female deaths occurred, and in any given age group, generally only a fraction of one death was expected.

		Male		Female			
			Actual/	Actual/			
	Actua	Expecte	Expecte	Actua	Expecte	Expecte	
Age	1	d	d	1	d	d	
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%	

Table 51998-2003 Active MortalityMSRS-Correctional

Source: "Experience Study, 1998-2003, Minnesota State Retirement System, MSRS-Correctional", Mercer Human Resources Consulting, June 2004

Mortality for retirees is displayed in Table 6. Again there are not many observations due to the small number of individuals at risk, particularly for females. For males, in total 91.78 deaths were expected and 81 occurred, creating an actual/expected ratio of 88 percent, creating some support to decrease mortality assumptions (increase life expectancy). For females, the small number of actual and expected deaths often makes it impossible to obtain actual/expected ratios near one for given age groups. At age 50-54, under current assumptions .17 deaths was expected. Assuming that has some predictive value, the most logical outcomes are either zero or one death. One occurred, creating an actual/expected ratio of 591 percent. Overall for females, 16.58 deaths were expected and 19 occurred, creating a 115 percent ratio. That ratio suggests a need to increase the probabilities of female death, but given the small sample size it seems best to conclude that no meaningful conclusion can be drawn from that female data.

Table 6 1998-2003 Retiree Mortality MSRS-Correctional

		Male		Female			
			Actual/			Actual/	
	Actua	Expecte	Expecte	Actua	Expecte	Expecte	
Age	1	d	d	1	d	d	
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%	

Source: "Experience Study, 1998-2003, Minnesota State Retirement System, MSRS-Correctional", Mercer Human Resources Consulting, June 2004

The actuary also reviewed disability mortality, but concluded that the sample was too small to draw any meaningful conclusion from the data. Disability mortality is displayed in Table 7.

	MSRS-Correctional										
Age	Actua 1	Expecte d	Actual/ Expecte d								
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%								

Table 71998-2003 Disability Retiree MortalityMSRS-Correctional

Source: "Experience Study, 1998-2003, Minnesota State Retirement System, MSRS-Correctional", Mercer Human Resources Consulting, June 2004

Table 8 displays the current mortality assumptions and actuary-recommended mortality assumption changes. The mortality tables are named and are meaningful for actuaries but, for Commission purposes, displaying an actual set of probabilities of death or probabilities of survival would be more useful. The proposed change will increase plan cost. The table refers to the 1983 Group Annuity Mortality Tables, which could be displayed as a table of probability of death at each given age. Males tend to have higher mortality than females at any given age, so male and female specific tables are used. Table 8 refers to mortality tables which are "set back," or "moved forward." This is best described by example. The current assumed mortality for pre-retirement males is the male 1983 Group Annuity Mortality Table set back one year, meaning that the mortality for males assumed at any given age is the mortality rate stated in the male 1983 Group Annuity Mortality Table for an individual one year younger (a pre-retirement male in the MSRS-Correctional Plan age 50 is assumed to have the mortality risk stated in the mortality table for a male age 49; a male age 49 is assumed to have the mortality risk or rate stated for a male age 48, etc.).

For pre-retirement and post-retirement mortality, the actuary is recommending that MSRS-Correctional use the same mortality tables as are currently used for MSRS-General. The basis for that conclusion presumably is that mortality results for the Correctional Plan are sketchy, at best. Lacking any clear evidence that MSRS-Correctional active and retired mortality differ from that of the state employees and retirees in general, a reasonable conclusion is that MSRS-Correctional should use the same assumptions as are used in the plan that covers the vast majority of state employees, MSRS-General.

An implication of this change, however, is that the post-retirement mortality assumption for females would be changed in a direction which is *opposite* the change suggested for this group by the plan's data. In Table 6, for the female group as a whole there were 19 deaths, and 16.58 were expected, creating an actual/expected ratio of 115 percent. That data, by itself, suggests that if any change were to be recommended for this group, it would be to assume higher mortality (lower life-expectancy). In Table 7, though, the actuary is proposing to assume lower mortality (increased life expectancy). The Commission may wish to question the MSRS actuary about this recommendation. One argument for the proposed change is that data is insufficient to conclude that MSRS-Correctional mortality differs from MSRS-General mortality. Another is that data for males is consistent with a need to lower mortality assumptions, and demographers have come to expect, based on studies of large populations, a certain relationship between male and female mortality assumption should be changed also to maintain that relationship, even if that change is not supported by the limited observed female data from this experience study.

The Commission also may wish to question MSRS or its actuary about the current and proposed mortality assumptions for disabilitants, referred in Table 8 as "post-disability" mortality. Some

description of what is meant by "combined annuity mortality" would be useful. I also note that neither the current or proposed assumption for disabilitants matches that used in MSRS-General. It is unclear why this particular proposal is being made. If the actuary is contending that the preretirement and post-retirement mortality assumptions in the MSRS-Correctional Plan should match those of MSRS–General, why not also adopt the MSRS-General disability mortality assumptions? In the last actuarial valuation for the MSRS-General Plan, the General Plan seemed to have sex-specific disability mortality assumptions, described as, "1965 RRB rates through age 54. For ages 55 to 64, graded rates between 1965 RRB rates and the Healthy Post-Retirement mortality table. For age 65 and later, the Healthy Post-Retirement mortality table."

Table 8Mortality AssumptionsCurrent and Proposed TablesMSRS-Correctional

	Current Assumption	Proposed Assumption			
Pre- Retirement	Male: 1983 Group Annuity Mortality set back 1 year Female: 1983 Group Annuity Mortality	Male:1983 Group Annuity Mortality set back 5 yearsFemale:1983 Group Annuity Mortality set back 2 years			
Post- Retirement	Male: 1983 Group Annuity Mortality set forward 2 years Female: 1983 Group Annuity Mortality set forward 2 years	Male: 1983 Group Annuity Mortality set back 2 years Female: 1983 Group Annuity Mortality set back 1 year			
Post- Disability	Combined Annuity Mortality	Combined Annuity Mortality up to age 40, grading to healthy mortality for ages 60 and up			

e. <u>Disability Assumptions</u>. The results for disability as reported in the experience study appears in Table 9 below, which reproduces the table found on page 22 of the experience study. The provided information appears to be incorrect. MSRS should provide an explanation and any necessary corrections to the Commission, so the Commission can make an informed judgment in deciding whether to approve the proposed new disability assumptions.

Information in the table seems inconsistent, and it is not clear which portions of the table can be assumed to be reliable at the current time. If Commission members examine the last line in Table 9, which claims to provide the total number of male and female disabilitants over all age groups combined, the claim is that there are 35 disabled males and 33 disabled females, which add to 68. However, in the column combining the male and female totals, only 66 are listed. The information for individual age groups is also inconsistent, leading to incorrect actual/expected ratios for many of the age groups. For the age 25-29 group, the table claims there are no male disabilitants and two female disabilitants, while the combined total column for that age group claims there are no disabilitants. For the 30-34 age group we have 7 males and 4 females but a combined total of only 6. For the 40-44 age group, 3 males and 3 females somehow total 11. For the 50-54 age group, 9 males and 7 females total to 18. At age 55-59, we have 4 males and 3 females but a combined total of only 4. At age 60-64, we have 1 disabled male and 1 disabled female and a claimed total of 3.

Table 91998-2003 DisabilitiesMSRS-Correctional

		Males			Females			Total	
			Actual/			Actual/			Actual/
	Actua	Expecte	Expecte	Actua	Expecte	Expecte	Actua	Expecte	Expecte
Age	1	d	d	1	d	d	1	d	d
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%

Source: "Experience Study, 1998-2003, Minnesota State Retirement System, MSRS-Correctional", Mercer Human Resources Consulting, June 2004 Table 10 displays the existing and proposed disability assumptions. The new assumptions would increase the probability of disability at every age for males, and would double disability rates for females, adding to plan costs.

Table 10Disability AssumptionsCurrent and Proposed RatesMSRS-Correctional Plan

	Current As Per 10	sumption),000 rences	Curr Assum Percer	rent option	Proposed A Per 10	ssumption 0,000	Proposed A	ssumption
Age	Male	Female	Male	Female	Male	Female	Male	Female
$\frac{11ge}{20}$	4	4	04%	04%	5	8	05%	08%
20	4	4	.04%	.04%	5	8	05%	.0070
21	5	5	.04%	.04%	7	10	07%	10%
22	5	5	.05%	.05%	7	10	.07%	10%
23	6	6	.05%	.05%	8	10	08%	12%
24	0	0	.0070	.0070	0	12	.0070	.1270
25	6	6	.06%	.06%	8	12	.08%	.12%
26	6	6	.06%	.06%	8	12	.08%	.12%
27	7	7	.07%	.07%	9	14	.09%	.14%
28	7	7	.07%	.07%	9	14	.09%	.14%
29	8	8	.08%	.08%	11	16	.11%	.16%
20	0	0	000/	000/		16	110/	1.60/
30	8	8	.08%	.08%	11	16	.11%	.16%
31	9	9	.09%	.09%	12	18	.12%	.18%
32	9	9	.09%	.09%	12	18	.12%	.18%
33	10	10	.10%	.10%	13	20	.13%	.20%
34	10	10	.10%	.10%	13	20	.13%	.20%
35	11	11	.11%	.11%	15	22	.15%	.22%
36	12	12	.12%	.12%	16	24	.16%	.24%
37	13	13	.13%	.13%	17	26	.17%	.26%
38	15	15	.15%	.15%	20	30	.20%	.30%
39	16	16	.16%	.16%	21	32	.21%	.32%
40	18	18	18%	18%	24	36	24%	36%
41	20	20	20%	20%	27	40	27%	40%
42	20	22	22%	22%	29	44	29%	44%
43	24	24	.22%	24%	32	48	32%	48%
44	26	26	.26%	.26%	35	52	.35%	.52%
45	29	29	29%	29%	30	58	39%	58%
46	32	32	32%	32%	43	50 64	43%	.5070 64%
40 47	36	36	36%	36%	43	72	.43%	.0470 72%
47	30 41	41	.30%	.30%	40 55	82	.40%	82%
49	46	46	.46%	.46%	61	92	.61%	.92%
50	50	50	.50%	.50%	67	100	.67%	1.00%
51	57	57	.57%	.57%	76	114	.76%	1.14%
52	64	64	.64%	.64%	85	128	.85%	1.28%
53	72	72	.72%	.72%	96	144	.96%	1.44%
54	80	80	.80%	.80%	107	160	1.07%	1.60%
55	88	88	.88%	.88%	117	176	1.17%	1.76%
56	98	98	.98%	.98%	131	196	1.31%	1.96%
57	108	108	1.08%	1.08%	144	216	1.44%	2.16%
58	118	118	1.18%	1.18%	157	236	1.57%	2.36%
59	129	129	1.29%	1.29%	172	258	1.72%	2.58%
60	141	141	1.41%	1.41%	188	282	1.88%	2.82%
61	154	154	1.54%	1.54%	205	308	2.05%	3.08%
62	167	167	1.67%	1.67%	223	334	2.23%	3.34%
63	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0
65+	0	0	0	0	0	0	0	0

f. <u>Impact on Plan</u>. Table 11 below is information provided by Mercer and MSRS demonstrating the impact of each of the proposed changes on the July 1, 2002, actuarial results. The turnover (withdrawal) change has the largest impact, adding 2.1 percent of pay to the contribution requirements. The revised mortality assumption changes would add 1.8 percent of pay, while disability assumption changes add .8 percent of pay. The retirement assumption changes decrease costs slightly. The total impact from all of the assumption changes combined is 4.2 percent of pay, which would have increased the total required contributions in 2002 from 14.7 percent of pay to 18.9 percent of pay.

Review of previous tables would indicate that there were by far more observations of withdrawal (turnover) than any other assumption under study. Therefore, the recommended new withdrawal assumption is based on more information than the proposals for mortality, disability, or retirement age. There were few deaths, particularly for females, because of the small size of the plan. The proposed mortality assumptions seem based on a conclusion that MSRS-General assumptions should be adopted for this Correctional Plan because there is insufficient evidence to conclude that mortality experience for this plan should differ from the majority of state employees. As of this writing, the basis for the change in disability probabilities needs more explanation. The disability results as reported in the experience study for the 1998-2003 period are incorrect.

An additional complication for the Commission in attempting to understand the cost impact of the package of assumption changes is that the actuary did not indicate whether the computations in Table 11 were based on a revised full funding date. The full funding date would need revising from the current full funding date for this plan, 2032, back to the year 2020. Minnesota Statutes, Section 356.215, Subdivision 11, seems to require that change, as the fund moves from being more than fully funded to a plan that has unfunded liabilities needing to be amortized. It is not known whether the actuary used a revised funding date in determining the "After Assumption Changes" column. If not, the supplemental contribution (amortization contribution) may be higher than indicated. The Commission may wish to verify through testimony whether a 2020 amortization date was used in the computations.

Table 11
Impact of Recommended Assumption Changes
As of July 1, 2002
MSRS-Correctional

	Before						After
	Assumption	Mortalit	Disability	Retiremen	Withdrawa		Assumption
	Changes	У	*	t	1	Total	Changes
Normal Cost	15.0%	0.7%	0.6%	-0.3%	2.0%	3.0%	18.0%
Supplemental Contribution	-0.5%	1.1%	0.2%	-0.2%	0.1%	1.2%	0.7%
Expense Allowance	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Total Required Contribution	14.7%	1.8%	0.8%	-0.5%	2.1%	4.2%	18.9%
Statutory Contributions	13.7%						13.7%
Sufficiency/(Deficiency)	-1.0%						-5.2%

* Disability rates and disability mortality

The impact of these changes on the 2002 valuation is shown below. A problem for the Commission is that the actuary demonstrated the impact on the 2002 actuarial valuation results, which seems odd given that the experience study was completed in June 2004 and included experience through 2003. The results may not hold exactly if applied against a 2003 or later actuarial valuation.

Table 12Impact of Actuarial Changes on2002 MSRS-Correctional Valuation

		2002	Differenc 2002 and Imp	e Between act of Changes	Impact o 2002	of Changes on Valuation
Membership						
Active Members		3,249				3,249
Service Retirees		754				754
Disabilitants		115				115
Survivors		69				69
Deferred Retirees		550				550
Nonvested Former Members		<u>268</u>				<u>268</u>
Total Membership		5,005				5,005
Funded Status						
Accrued Liability		\$446,426,000		\$28,052,255		\$474,478,255
Current Assets		\$457,416,000				<u>\$457,416,000</u>
Unfunded Accrued Liability		(\$10,990,000)		\$28,052,255		\$17,062,255
Funding Ratio	102.46%		(6.06%)		96.40%	
Financing Requirements						
Covered Payroll		\$131,232,000				\$131,232,000
Benefits Payable		\$17,105,000				\$17,105,000
Normal Cost	14.97%	\$19,646,000	3.03%	\$3,975,760	18.00%	\$23,621,760
Administrative Expenses	<u>0.21%</u>	\$276,000			<u>0.21%</u>	<u>\$276,000</u>
Normal Cost & Expense	15.18%	\$19,922,000	3.03%	\$3,975,760	18.21%	\$23,897,760

	2002		Difference 2002 and Impa	e Between act of Changes	Impact of Changes on 2002 Valuation	
				-		
Normal Cost & Expense	15.18%	\$19,922,000	3.03%	\$3,975,760	18.21%	\$23,897,760
Amortization	(0.45%)	<u>(\$591,000)</u>	1.15%	<u>\$1,509,624</u>	0.70%	<u>\$918,624</u>
Total Requirements	14.73%	\$19,331,000	4.18%	\$5,485,384	18.91%	\$24,816,384
Employee Contributions	5.69%	\$7,467,000			5.69%	\$7,467,000
Employer Contributions	7.98%	\$10,472,000			7.98%	\$10,472,000
Employer Add'l Cont.	0.00%	\$0			0.00%	\$0
Direct State Funding	0.00%	\$0			0.00%	\$0
Other Govt. Funding	0.00%	\$0			0.00%	\$0
Administrative Assessment	0.00%	<u>\$0</u>			0.00%	<u>\$0</u>
Total Contributions	13.67%	\$17,939,000			13.67%	\$17,939,000
Total Requirements	14.73%	\$19,331,000	4.18%	\$5,485,384	18.91%	\$24,816,384
Total Contributions	13.67%	<u>\$17,939,000</u>			13.67%	<u>\$17,939,000</u>
Deficiency (Surplus)	1.06%	\$1.392.000	4.18%	\$5,485,384	5.24%	\$6.877.384

Analysis and Discussion

Draft Resolution 05-2 implements the actuarial assumption changes for the MSRS-Correctional Plan as recommended by Mercer Human Resource Consulting, the MSRS actuarial consultant, after accepting changes suggested by Mr. Custis, an actuary for Milliman USA, which was the Commission's actuarial consultant prior to elimination of the Commission actuary role. The actuarial assumption change recommendations raise several pension and related public policy issues that the Commission may wish to consider, after taking testimony from interested parties, as follows:

- 1. <u>Conformity with Minnesota Statutes, Section 356.215, and the Commission's Standards for Actuarial Work</u>. The study does appear to be consistent with requirements in statutes and the Commission standards, assuming that the actuary who signed the experience study is regularly engaged in providing experience studies and actuarial reports. One of the signers is Stephen T. McElhaney, a Fellow in the Society of Actuaries (FSA). Minnesota Statutes, Section 356.215, Subdivision 1, defines an "approved actuary" for our purposes as a preparer regularly engaged in the provision of actuarial reports, experience studies, and related actuarial services *and* either having at least 15 years of service to major public employee retirement plans or having the credential "Fellow of the Society of Actuaries."
- 2. Choice of Actuaries to Provide Experience Study. The issue is choice of actuaries who performed the study, and whether to seek additional review of the study by another actuary. Milliman USA was the Commission actuary in the years covered by the current study, and under law that firm performed all official actuarial valuations for this plan and many others, and also provided periodic experience studies for MSRS-General, PERA-General, and TRA. Clearly, Milliman USA had experience in producing experience studies for Minnesota public plans and Milliman USA had all the data needed for an MSRS-Correctional Plan experience study, because Milliman USA gathered the needed information during the course of preparing the plan's official annual actuarial valuations. The Commission may wish to inquire why MSRS did not use Milliman USA was able to provide a review of the Mercer study, at least of the recommendations that Mercer was proposing, having Milliman USA actually do the study might have further enhanced Commission member confidence in the study's recommendations.

Since Milliman USA is no longer under contract, the Commission may wish to consider requesting that MSRS have the Segal Company review the Mercer study prior to taking any action on the proposal. The Segal Company is jointly retained by the larger pension fund administrations and provides actuarial valuation/experience study services previously provided by a Commission-retained actuary.

3. <u>Issue of Lack of Statistically Reliable Results (Lack of Sufficient Observations)</u>. An issue with the study is whether data are sufficient to reject current assumptions. For disabilities, retirement age, mortality (for active members, retirees, and disabilitants), often there are not enough observations to provide meaningful results for the given age cohorts, and sometimes for the entire covered group. The actuaries state in the experience study that for active males, females, and for disabilitants, there were not enough deaths to permit any meaningful analysis. For active female mortality, the covered group is so small that no female deaths occurred during the study period. For other assumptions under study, there are so few expected events (sometimes a fraction of one person) and so few actual events that it would be impossible to obtain an actual/expected ratio near one for that given age group. With groups this small, the computed actual/expected ratios for given age groups can be changed drastically by a single random additional event.

The actuary's decision to reject current mortality assumptions and propose new ones deserves discussion. The actuary stated in the report that active and disabled member mortality data are insufficient to provide meaningful analysis, but new assumptions are proposed. Similarly, while there are more data on retired mortality, presumably enough to support a meaningful analysis, I noted earlier that the proposed retired female mortality assumption would lower mortality estimates (increase life-expectancy), although the data for females seems to support a change in the opposite direction. Recommendations to change assumptions seem based primarily upon professional judgment rather than the specific actual/expected ratios that were observed in the study. The Commission may wish to have the plan actuary explain how decisions were made regarding whether a current assumption was sufficiently reliable, and how an alternative was chosen which hopefully is more accurate for the plan.

4. <u>Specific Problem with the Disability Results</u>. The issue is whether the Commission should adopt the proposed new disability assumption (probabilities of becoming disabled), given that the disability information provided in the report is incorrect. Table 9, which reproduces the 1998-2003 disabilities table found on page 22 of the experience study, contains information that is in error. For most age groups (ages 25-29; 30-34; 40-44; 50-54; 55-59; and 60-64) adding the males and females actually disabled, according to the applicable male and female columns, does not equal the combined total for the given age group. This causes the actual/expected ratios to be similarly in error. If these numbers were used by the actuaries in their disability assumption review, they could not draw the correct conclusions.

This table raises questions about the quality of the review performed by Mercer Human Resource Consulting prior to release of the report, the quality of the MSRS review of that report, and the quality of the review by Mr. Custis of Milliman USA. While the immediate concern is with the disability results and the resulting disability recommendations, this table detracts from the general credibility of the entire report.

Hopefully, the table reflects drafting errors in producing the final report and does not reflect the actual information used by the actuaries to review the current assumption and upon which the new recommendation is based. The Commission may wish to have MSRS provide corrected information to the Commission, and to substantiate whether Mercer's review of this fund's disability experience was based on that correct information. The Commission may also wish to inquire about the information sent to Mr. Custis for his review. Were his review and his acceptance of the Mercer disability assumption recommendation based on correct information, or was it based on review of faulty results?

Consideration of Experience of Similar Groups; Potential Need to Refine Actuarial Assumptions in 5. Other Plans. The issue is whether, in revising any mortality actuarial assumptions, a common set of assumptions should be used unless there is conclusive evidence that a given plan differs from that norm. The mortality proposals in this Mercer study, and also the Mercer study recently completed for the MSRS State Patrol Plan, is a limited push in this direction, although it is limited in scope to looking for a model within the same pension fund system. Because there was so little mortality information, the actuaries chose to recommend that MSRS-Correctional should use the same mortality (both active and retired), as MSRS-General. However, a more fundamental issue remains unstudied: whether there should be more uniformity across systems. Is there sufficient basis to conclude that general public employee mortality differs depending upon whether the individuals are working for state government rather than local units of government? In other words, is there any basis for concluding that MSRS-General mortality differs from PERA-General mortality? Is there enough information to conclude that public safety plan (police and fire plan) mortality differs between public safety plans (the State Patrol Plan versus PERA-P&F), or differs from correctional plan mortality, or that any of these differ from general plan mortality?

These questions are worth addressing, but at the present time there would be little interest by the individual plan systems to do so. Given that the actuary who performed the current study was retained by MSRS, that employer would have little interest in looking beyond MSRS for a model to follow. The retirement systems could use Segal, the jointly-retained actuary, to examine these cross-system issues, but the individual retirement systems have little incentive to do so, and could view such as study as being contrary to their individual interests. These questions are appropriate for a state-level study, but the Commission no longer retains an actuary.

Table 13 below displays the current pre-retirement and post-retirement mortality assumptions for several MSRS, PERA, and TRA plans. All of these plans use the 1983 Group Annuity Mortality Table, but with different amounts of "set back" or "set forward," as explained in discussion of Table 8. Table 13 also includes the proposed assumptions for the State Patrol Retirement Plan and MSRS-Correctional. The mortality assumptions used are rarely comparable. Only two comparable plan groups, the employees and retirees covered by MSRS-Correctional and by the Local Government Correctional Employees Retirement Plan of the Public Employees Retirement Association (PERA-Correctional), have the same mortality assumptions. PERA-Correctional is a recently established plan. Since the plan has no track record when it started, and there was little or no basis to believe mortality

should differ between this plan and MSRS-Correctional, the Legislature chose to borrow the MSRS-Correctional assumptions to use in this plan. An issue for the Commission, if the Commission does decide to revise MSRS-Correctional assumptions, is whether to revise PERA-Correctional assumptions to remain in conformance. Regarding the State Patrol Retirement Plan and PERA-P&F, the occupations of the covered membership are comparable, presumably the active duty risks are comparable, yet we currently assume the two plans have different mortality experience. Is that justified?

Pension Plan	Gender	Pre- Retirement	Post- Retirement	Current Assumption	Proposed Assumption
MSRS-General	Males			-5	
MBRB General	Females	1		-2	
	Malas	·	1	-2	
	Females		✓ ✓	-2 -1	
MSRS-Correctional	Males	\checkmark		-1	-5
	Females	\checkmark		0	-2
	Males		\checkmark	+2	-2
	Females		\checkmark	+2	-1
State Patrol Plan	Males	\checkmark		-1	-5
	Females	\checkmark		0	-2
	Males		\checkmark	+2	-2
	Females		\checkmark	+2	-1
PERA-General	Males	\checkmark		-8	
	Females	\checkmark		-7	
	Males		\checkmark	-1	
	Females		\checkmark	-1	
PERA-Correctional	Males	\checkmark		-1	
	Females	\checkmark		0	
	Males		\checkmark	+2	
	Females		\checkmark	+2	
PERA-P&F	Males	\checkmark		-6	
	Females	\checkmark		-6	
	Males		\checkmark	-1	
	Females		\checkmark	-1	
TRA	Males	\checkmark		-12	
	Females	\checkmark		-10	
	Males		\checkmark	-6	
	Females		\checkmark	-3	

Table 13 Mortality Assumptions Relative to 1983 Group Annuity Mortality Table, for Males and Females Various Public Pension Plans

6. Cost Implications; Likely Actuarial Valuation Impact of the Proposed State Patrol Retirement Plan Actuarial Assumption Changes. The policy issue is the impact that the proposed MSRS-Correctional Plan assumption changes are likely to have on the funded condition and financing requirements of the retirement plan. The implications for required contributions were shown above in Table 11, however, we noted in discussing that table that it is possible that the results were computed using an incorrect amortization date. According to that table, the withdrawal assumption change, followed by mortality, have the largest impacts. The impact on the actuarial valuation was shown in Table 12. For some unknown reason, when this information was provided by MSRS during the 2005 Session, the impact was demonstrated using the 2002 actuarial valuation results. Given that the study included 2003 data and was completed in June 2004, it is odd that the impact was not demonstrated on a more recent actuarial valuation. Rather than try to update this information, which could introduce some error, the 2002 results are presented in this memo. Perhaps MSRS will have updated results provided by the actuary of your review.

Appendix A

Overview of Recent MSRS-Correctional Plan Contribution Sufficiencies/Deficiencies

This appendix provides an overview of the actuarial condition of this plan from 1991 through 2004. The deficiencies in this fund as indicated in the plan's actuarial reports have occurred only recently, beginning in 2000.

- 1. <u>Overview of Recent MSRS-Correctional Plan Contribution Sufficiencies/Deficiencies</u>. Attached is a chart summarizing the MSRS-Correctional actuarial reports from 1991 through 2004. Prior to 1999, the total contributions were approximately equal to the total requirements. In any actuarial work, there is always some year-to-year variation, which in some years resulted in modest contribution deficiencies and in other years modest contribution sufficiencies, with no obvious pattern. The funding ratio has been high from the early 1990s to the current date, but has dropped in the last few years, reflecting in part the strong investment markets throughout much of the period followed by recent weak periods. The fund was 94.43 percent funded in 1991 reached 100 percent or more funded in 1993. In the last couple of years, 2003 and 2004, the fund has dropped below full funding.
- 2. <u>Actions Taken in 1997</u>. To understand some of the funding changes that have occurred in the last several years, it is helpful to begin with 1997. Several changes occurred in 1997, due to actions by the Legislature, which began to impact the plan's funding. The first was that a significant benefit improvement/benefit revision bill was enacted, and part of that bill revised the MSRS-Correctional Plan and increased the plan contribution rates. The most significant benefit change was a revision in the retirement benefit. A 2.4 percent accrual rate level benefit was created, providing individuals with a level benefit of 2.4 percent of their high-five average salary per year of service, rather than a prior system of using a 2.5 percent accrual rate until the retiree reaches age 62 (the minimum age to begin receiving Social Security benefits) and then providing a recomputed benefit of 1.5 percent of the high-five salary per year of service. The second significant change was that reverse amortization was enacted for this plan, which previously had been used only for the PERA-P&F plan.

These impacts are evident in the July 1, 1997, actuarial valuation. The plan normal cost increased from 11.05 percent a year earlier to 14.34 percent, raising the total contribution requirements significantly. This was covered by a combination of the new employee contribution rate of 5.50 percent and the new employer contribution rate of 7.70 percent, and negative amortization. The plan was more than fully funded, and part of the assets above 100 percent funding were used through that negative amortization process to lower the contribution requirement below what it otherwise would have been. The end result was that the 1997 actuarial valuation showed a contribution surplus of .71 percent of pay. However, the apparent health of the fund was now dependent upon the surplus assets. The total contributions made to the fund by the employees and employers were less than the plan normal cost and expenses, which was 14.52 percent of payroll. Over the course of the next several years the surplus assets disappeared, some of it used up by the negative amortization, and much of it disappearing when the investment markets went bad.

3. <u>Revisions in 2000</u>. Numerous changes in actuarial assumptions and actuarial procedures occurred in 2000. Revisions were adopted in the male and female pre-retirement and post-retirement mortality tables, the male and female post-disability mortality table, retirement age, separation (termination) assumptions, and disability assumptions. Statutory revisions included a revision in age-related salary increase factors, and a revision in negative amortization procedures. Rather than using 2020 as the amortization date if negative amortization is occurring, the plan will use rolling 30-year negative amortization, pushing the amortization date for this plan from 2020 to 2030.

The Legislature also revised the way the actuarial value of assets is computed, moving to a system based on market value and weighted past deviations between the expected value of assets assuming 8.5 percent investment returns, and the actual value of assets given the investment return that actually occurred (Laws 2000, Chapter 461, Article 1, Section 3).

The impact of all of these changes is reflected in the 2000 actuarial valuation. There was little impact on plan normal cost; it actually decreased slightly compared to a year earlier. The plan, however, did move into a slight deficiency situation, .05 percent of payroll.

4. <u>Impacts on Later Valuations; Shift to Positive Amortization</u>. Over the next few actuarial valuations, the plan normal cost drifted upwards by .3 to .4 percent of payroll, and the impact of bad investment markets in the early 2000s began to show. The funding ratio fell after 2001, and there was less negative amortization to offset the total contribution requirements. By the 2003 actuarial valuation, the surplus assets had disappeared as the funding ratio fell to 97.06 percent. Rather than negative amortization to decrease the apparent total requirements, there was a need to amortization some

unfunded liability. Since the employee and employer contributions are not sufficient to cover the normal cost and expenses, a not insignificant contribution deficiency occurred.

It is worth further discussing this change from negative to positive amortization. As the plan shifted from having surplus assets in 2002 to an unfunded liability in 2003, the full funding date should have dropped from 2032 to 2020 in the 2003 valuation, but it did not. That seems to reflect an error in the actuarial work for the plan. In 2004, the new actuary jointly retained by the pension funds dropped the full funding date to 2020, a change which probably should have occurred a year earlier. Shortening the amortization period gives less time to pay off unfunded liabilities, raising the amortization factor above what would occur if the amortization date remained at 2032. If the amortization date were left at 2032, the amortization requirement would be about 1.5 percent of pay rather than 2.31 percent of salary, and the contribution deficiency would be 3.0 percent of salary, rather than 3.81 percent of salary.

Shortening the amortization period does seem a correct interpretation of existing law, but the Commission may wish to review that policy and may choose to revise the law. The applicable law is Minnesota Statutes, Section 356.215, Subdivision 11. Paragraph (f) governs the amortization date in the 2002 and earlier valuations. That provision states that if a plan has assets in excess of its liabilities, negative amortization will be used over a rolling 30-year period beginning anew with each actuarial valuation. That resulted in a 2032 amortization date in the 2002 valuation. When the plan dipped below full funding in 2003, procedures governing full funding dates for plans with unfunded liabilities should have been used. Those provisions are stated in paragraphs (b) and (c) of the subdivision. If there were no actuarial assumption changes, benefit changes, or changes in the actuarial cost method, paragraph (c) governs, which indicates a full funding date of 2020.

While use of a 2020 amortization date appears to be the proper interpretation of law, the result may not reflect the best pension policy. An approach which the Commission may wish to consider for plans that were using negative amortization and suddenly find themselves with unfunded liabilities is to revise the full funding date to coincide with the average remaining working lifetime of the covered membership, rather than reverting to 2020. Using 2020 is problematic now and it will be more problematic as the 2020 date draws nearer.

5. <u>Current Situation</u>. All surplus assets have dissipated due to the investment markets and the use of previous surplus assets to cover the difference between the total employee and employer contributions and the total requirements. If all actuarial assumptions were to hold in the future, including the assumed annual 8.5 percent investment return, the contribution deficiencies will begin to create more unfunded liability, adding to the amortization requirement and worsening the deficiency. Without an increase in the contribution rate to cover the portion of normal cost plus expenses that is now uncovered, and a further increase to cover the amortization requirement, the funding ratio will fall further, and the total contribution requirement will grow due to further increases in the amortization requirement.

In a realistic setting, the outcome is less certain. Plan experience will depart from the assumptions, and investment markets are rarely average, tending to go through periods of above-average returns followed by periods of below-average returns. Good investment markets could create funding ratios in this plan above 100 percent, again creating negative amortization to cover the inability of current contributions to cover the full normal cost plus expenses. Weak investment markets would have the opposite effect, harming the MSRS-Correctional funding ratio, adding to the amortization requirement, and creating further deficiencies in contribution requirements.

Appendix B

Background Information on MSRS-Correctional

The premise for MSRS-Correctional coverage is that certain employment positions in correctional or analogous security hospital or psychopathic personality treatment center service place individuals in a high degree of physical danger, and there is sufficient need for a particularly vigorous workforce in these specific positions to warrant a separate plan with larger retirement benefits payable at an earlier normal retirement age than is the case in a general employee plan.

MSRS-Correctional was established in 1973 as a result of collective bargaining by the State of Minnesota with the American Federation of State, County and Municipal Employees (AFSCME), Council 6, and the resulting implementing legislation. Up to that point, correctional guards and most other correctional system employees were covered by General State Employees Retirement Plan of the Minnesota State Retirement System (MSRS-General). Some correctional system employees were covered by the Teachers Retirement Association (TRA). MSRS-Correctional was created as a separate plan, with the membership in 1973 largely limited to correctional guards and correctional counselors in adult correctional facilities. In subsequent years, the coverage group was expanded to include additional correctional positions in both adult and juvenile correctional facilities. Large increases occurred in the mid-1990s, with an increase of more than 400 state employees due to inclusion of 33 additional employment classifications who were certified by the Department of Corrections or the Department of Human Services as having at least 75 percent inmate or patient contact, and an additional 31 positions at correctional facilities or at the state security hospital. In 1999, the MSRS-Correctional Plan membership was increased by an estimated 115 state employees employed in nine employment positions with the Minnesota Extended Treatment Option (METO) on-campus program at the Cambridge Regional Human Services Center. In 2000, various other positions were added, providing that the individual was certified as having at least 75 percent inmate contact. A partial list of positions included the director and assistant group supervisor of the former Phoenix/Pomiga treatment/behavioral change program at the Minnesota Correctional Facility-St. Cloud, and the following positions at certain correctional facilities: registered nurse practitioners, behavioral analyst 2, psychologist 2, dental hygienist, and dental assistant registered. In 2004, three positions at the Minnesota Correctional Facility-Rush City, were added, which are the correctional discipline unit supervisor, dental hygienist, and psychologist 2.

About 85 percent of MSRS-Correctional Plan members are Department of Corrections employees and about 15 percent are Department of Human Services employees. The correctional facilities with the largest numbers of MSRS-Correctional Plan members are MCF-Stillwater, MCF-Lino Lakes, MCF-St. Cloud, and MCF-Faribault. The plan currently has 3,326 members covering approximately 100 employment classifications. Correctional officers comprise the largest single occupational group covered by the plan.

One of the attractions of MSRS-Correctional for groups seeking this coverage is that the plan pays higher benefits than a general employee plan and has an earlier normal retirement age. While this coverage is advantageous to the employee, it is more expensive for the employer because of the higher benefits and earlier retirement age in the Correctional Plan compared to the General Plan. The Correctional Plan offers a hybrid of general employee plan and public safety plan features. MSRS-Correctional members are coordinated members, like members of MSRS-General and unlike members of the Public Employees Retirement Association Police and Fire Plan (PERA-P&F). Like a public safety plan, members can retire without a reduction for early retirement at age 55 or with a reduction at age 50. This annuity is computed using a 2.4 percent per-year-of-service benefit accrual factor. (For each year of covered service, the individual will receive 2.4 percent of the high-five average salary, which is the five years of covered salary which produces the highest average.) Duty-related disability benefits are generous, typical of a public safety plan. The duty-related disabilitant receives 50 percent of high-five average salary, plus 2.4 percent of high-five average salary for each year in excess of 20 years of allowable service. Also like a public safety plan, MSRS-Correctional uses an occupational definition of disability rather than the total impairment disability definition used by MSRS-General.

Another attraction of MSRS-Correctional coverage is that post-retirement health care coverage may be provided by the employer. MSRS administrators indicate that eligibility may depend upon the specific union to which the member belongs.

The public safety-type features of this plan make the plan considerably more expensive than a general employee plan. In 1993, the actuary computed the total contribution requirements of this plan to be 15.83 percent of pay, while the MSRS-General total requirement was 9.43 percent of pay, a difference of 6.4 percent of pay.

Besides the level of cost, another difference between public safety plans and general employee plans is the way cost is shared between the employees and employer. In general employee plans the norm is to share cost equally, at least the normal cost plus expenses. In contrast, in public safety plans the norm is to have the employees pay approximately 40 percent of these costs while the employer pays about 60 percent.