1989 Actuarial Valuations

Section 1 - State Employees (General)

Section 2 - State Employees (Correctional)

Section 3 - State Patrol

Section 4 - Judges

Section 5 - Legislators

Section 6 - Elective State Officers

STATE EMPLOYEES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1989

THE Wyatt COMPANY

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

15TH FLOOR
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

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EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 7, 1989

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: STATE EMPLOYEES RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1989 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on September 20, 1989.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

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Actuary

STATE EMPLOYEES RETIREMENT FUND

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STATE EMPLOYEES RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/88 VALUATION	07/01/89 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352 % of Payroll	7.63%	8.85%
2. Required Contributions - Chapter 356 % of Payroll	7.61%	8.14%
3. Sufficiency (Deficiency) (A1-A2)	0.02%	0.71%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	$1,644,145	$1,871,542
b. Current Benefit Obligations (Table 8)	$1,775,445	$2,109,272
c. Funding Ratio (a/b)	92.60%	88.73%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	$1,644,145	$1,871,542
b. Actuarial Accrued Liability (Table 9)	$2,115,476	$2,456,686
c. Funding Ratio (a/b)	77.72%	76.18%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$2,824,501	$3,467,695
b. Current and Expected Future Benefit Obligations	$2,820,611	$3,239,884
c. Funding Ratio (a/b)	100.14%	107.03%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	47,040	48,653
b. Projected Annual Earnings	$1,316,671	$1,418,160
c. Average Annual Earnings (Actual $)	$27,990	$29,148
d. Average Age	40.2	40.5
e. Average Service	9.3	9.4
2. Others		
a. Service Retirements (Table 4)	11,455	11,564
b. Disability Retirements (Table 5)	669	665
c. Survivors (Table 6)	753	850
d. Deferred Retirements (Table 7)	1,162	1,355
e. Terminated Other Non-vested (Table 7)	4,084	3,924
f. Total	18,123	18,358

STATE EMPLOYEES RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions for the State Employees Retirement Fund are sufficient for 1989 by an amount of 0.71% of payroll. According to this valuation a contribution rate of 8.14% is required to comply with Minnesota Law.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 88.73%. The corresponding ratio for the prior year was 92.60%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used. For 1989 the ratio is 76.18%, which is a decrease from the 1988 value of 77.72%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This ratio, which is greater than 100%, verifies that the current statutory contributions are adequate.

Asset Information (Tables 1 and 2)

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value of the Assets Available for Benefits and one-third of the difference between the market value and cost value of those assets.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1990 when benefits will be increased for those annuitants who have been receiving payments for at least 7 months. Next year's valuation will include the 1990 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the excess earnings for the January benefit increase as well as the Fund's allocated market share of MPRIF. An approximation of those values on June 30, 1989 is provided below:

MPRIF Reserves	$701,989,000
Reserves Plus Excess Earnings	729,000,000
MPRIF Market Value	791,000,000

Membership Data (Tables 3, 4, 5, 6 and 7)

Tables 3 through 6 summarize statistical information about members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year except in the case of new hires whose earnings have been annualized.

The service retirements are shown in Table 4 and disabled members are shown in Table 5. The survivors category (Table 6) includes spouses and children of deceased members.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The July 1, 1989 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table. This table shows the impact of the changes in plan provisions on the liabilities under the old actuarial assumptions. See page 9 for an explanation of the changes in plan provisions.

	Old Benefits	New Benefits
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$727,281,000	$732,848,000
Current Employees -		
Accumulated employee contributions including allocated investment income	421,822,000 *	454,132,000 *
Employer-financed vested	610,813,000	848,376,000
Employer-financed nonvested	172,469,000	138,545,000
Total Pension Benefit Obligation	$1,932,385,000 *	$2,173,901,000

* Estimated

The following table shows the impact of the change in actuarial assumptions using the new plan provisions. See page 11 for an explanation of the change in actuarial assumptions.

	Old Assumptions	New Assumptions
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$732,848,000	$738,283,000
Current Employees -		
Accumulated employee contributions including allocated investment income	454,132,000 *	454,132,000 *
Employer-financed vested	848,376,000	785,507,000
Employer-financed nonvested	138,545,000	131,350,000
Total Pension Benefit Obligation	$2,173,901,000	$2,109,272,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) illustrates the two techniques for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- A gain from salaries where the average increase was 4.6% compared to the expected 6.5%.
- A gain from Current Assets because the return was 14.2% instead of the assumed 8%.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- Normal Costs based on the Entry Age Normal Actuarial Cost Method
- A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability
- An Allowance for Expenses

Table 11 shows the Fund has a contribution sufficiency since the Statutory Contribution Rate is 8.85% compared to the Required Contribution Rate of 8.14%.

Projected Cash Flow (Table 12)

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rates for employees. As members become eligible for payments from MPRIF an amount of reserve is transferred to SBI. The other disbursements represent benefit payments made directly by the Fund.

This projected cash flow assumes that future payrolls increase by 6.5%. This is the only table in the report where new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8.5% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year. The amount for 1991 is large because it includes those already over age 65 who are assumed to retire a year from the valuation date.

Changes in Plan Provisions

There were numerous changes in benefits in 1989 that are recognized in the July 1, 1989 actuarial valuation. The significant changes in benefits are summarized below.

- The service requirement for the normal retirement benefit, early retirement benefit, disability benefit, surviving spouse annuity and deferred benefit was reduced from 5 years to 3 years.

- Special rules apply to those members who were hired before July 1, 1989. The early retirement benefit was changed to be the greater of:

  - 1% of average salary for the first 10 years of service and 1.5% of average salary for each additional year. The early retirement reduction is .25% for each month that retirement precedes age 65 or age 62 if 30 years of service. If member meets the Rule of 90 requirement, there is no early retirement reduction; or

  - 1.5% of average salary for each year of service. The early retirement reduction is an actuarial equivalent reduction with augmentation at 3% per year to age 65.

- The deferred annuity is now augmented at 5% a year for each year that the benefit is deferred beyond age 55.

- The interest rate credited on refund of member contributions was increased from 5% to 6%.

- The joint and survivor annuity option now provides a bounce back feature without additional reduction.

	Impact Due To Changes In Plan Provisions
Actuarial Accrued Liability	$231,167,000
Pension Benefit Obligation for GASB No. 5	241,516,000
Normal Cost	1.02%
Supplemental Contribution	.71%
Required Contribution	1.73%

Changes in Actuarial Assumptions

The pre-retirement interest rate assumption has been increased from 8.0% to 8.5%. Also, the amortization target date has been changed to July 1, 2020.

	Impact Due To Changes In Actuarial Assumptions	
	Interest Rate Change	Amortization Date Change
Actuarial Accrued Liability	($73,627,000)	$0,000,000
Pension Benefit Obligation for GASB No. 5	(64,629,000)	0,000,000
Normal Cost	(.47%)	.00%
Supplemental Contribution	(.15%)	(.39%)
Required Contribution	(.62%)	(.39%)

TABLE 1

STATE EMPLOYEES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1989

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$22,377	$22,377
2. Investments		
a. Fixed Income	268,723	264,885
b. Equity	867,946	750,862
c. Real Estate	103,044	82,588
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	701,989	701,989
4. Other	2,972	2,972
B. TOTAL ASSETS	$1,967,051	$1,825,673
C. AMOUNTS CURRENTLY PAYABLE	$1,257	$1,257
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$316,302	$316,302
2. Employer Reserves	941,931	800,553
3. MPRIF Reserves	701,989	701,989
4. Non-MPRIF Reserves	5,572	5,572
5. Total Assets Available for Benefits	$1,965,794	$1,824,416
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$1,967,051	$1,825,673

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$1,824,416
2. Market Value (D5)	$1,965,794	
3. Cost Value (D5)	1,824,416	
4. Market Over Cost (F2-F3)	$141,378	
5. 1/3 of Market Over Cost(F4)/3		47,126
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$1,871,542

TABLE 2

STATE EMPLOYEES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS AND ASSET ALLOCATION
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	$1,713,674	$1,609,381
B. OPERATING REVENUES		
1. Member Contributions	$43,957	$43,957
2. Employer Contributions	45,401	45,401
3. Investment Income	110,861	110,861
4. MPRIF Income	73,477	73,477
5. Net Realized Gain (Loss)	20,841	20,841
6. Other (Includes State Appropriation)	1,100	1,100
7. Net Change in Unrealized Gain (Loss)	37,085	0
8. Total Revenue	$332,722	$295,637
C. OPERATING EXPENSES		
1. Service Retirements	$66,942	$66,942
2. Disability Benefits	2,662	2,662
3. Survivor Benefits	0	0
4. Refunds	7,898	7,898
5. Expenses	2,660	2,660
6. Other	474	474
7. Total Disbursements	$80,636	$80,636
D. OTHER CHANGES IN RESERVES	34	34
E. ASSETS AVAILABLE AT END OF YEAR	$1,965,794	$1,824,416

TABLE 3

STATE EMPLOYEES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1989

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	1,142	962	95						2,199
25-29	1,329	3,190	1,480	167					6,166
30-34	1,136	2,883	2,566	1,543	160				8,288
35-39	913	2,342	2,231	2,352	1,227	153			9,218
40-44	623	1,628	1,453	1,705	1,465	824	66		7,764
45-49	334	962	848	980	740	889	374	43	5,170
50-54	196	574	621	713	538	536	388	343	3,909
55-59	120	348	460	552	485	488	342	455	3,250
60-64	60	150	310	435	388	376	172	242	2,133
65+	19	44	91	124	109	92	31	46	556
TOTAL	5,872	13,083	10,155	8,571	5,112	3,358	1,373	1,129	48,653

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	5,894	17,139	19,088						11,383
25-29	8,656	20,663	22,547	22,656					18,581
30-34	8,491	22,080	24,631	25,692	26,002				21,756
35-39	9,461	23,109	25,708	28,269	28,163	26,522			24,432
40-44	9,621	23,028	26,213	29,720	32,366	30,935	32,078		26,696
45-49	8,682	22,679	25,620	29,390	31,678	33,333	34,040	32,713	27,555
50-54	9,184	21,501	24,631	27,626	29,932	31,103	34,343	35,089	27,442
55-59	8,036	20,263	24,105	27,338	28,517	29,670	33,024	35,791	27,718
60-64	8,940	18,847	24,445	26,072	27,491	28,567	29,871	35,123	26,877
65+	14,607	20,038	19,038	25,776	27,314	28,010	27,432	32,441	25,152
ALL	8,343	21,600	24,741	27,852	29,959	30,866	33,107	35,181	23,915

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
48,989	282,590	251,250	238,716	153,151	103,649	45,456	39,719	1,163,520

TABLE 4

STATE EMPLOYEES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1989

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	3	3						6
55-59	39	201						240
60-64	233	1,069	112					1,414
65-69	153	1,670	1,073	18				2,914
70-74	8	257	1,882	578	13			2,738
75-79		4	173	1,649	234	11	1	2,072
80-84		1	2	298	886	87	14	1,288
85+				8	264	385	235	892
TOTAL	436	3,205	3,242	2,551	1,397	483	250	11,564

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	8,811	4,609						6,710
55-59	3,240	8,236						7,424
60-64	5,811	7,536	9,097					7,376
65-69	5,212	6,011	6,998	7,644				6,343
70-74	4,331	5,291	5,894	5,875	3,123			5,816
75-79		3,517	5,325	4,602	4,490	2,152	1,537	4,633
80-84		3,743	10,155	5,129	4,083	2,800	2,459	4,230
85+				7,204	3,799	2,958	3,018	3,261
ALL	5,364	6,596	6,343	4,982	4,089	2,911	2,981	5,588

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
2,339	21,141	20,563	12,709	5,712	1,406	745	64,615

TABLE 5

STATE EMPLOYEES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1989

AGE	YEARS DISABLED							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	3	17	10	2				32
50-54	5	15	6	3	1			30
55-59	10	30	18	3				61
60-64	21	43	37	16	5	1		123
65-69		22	83	47	15	5	1	173
70-74			25	100	14	7		146
75-79				28	21	6	3	58
80-84					15	7	2	24
85+						4	14	18
TOTAL	39	127	179	199	71	30	20	665

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	1,289	3,347	4,184	3,435				3,421
50-54	6,215	4,699	2,685	2,487	1,174			4,210
55-59	4,019	4,800	4,324	3,887				4,486
60-64	4,409	3,527	5,153	4,712	2,545	1,350		4,263
65-69		4,158	4,665	3,670	3,190	2,986	3,466	4,147
70-74			3,796	3,921	2,729	2,542		3,719
75-79				4,111	2,355	3,520	3,424	3,378
80-84					3,475	2,337	1,576	2,985
85+						2,077	2,765	2,612
TOTAL	4,301	4,051	4,517	3,925	2,839	2,662	2,780	3,923

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
168	515	807	781	202	80	56	2,609

TABLE 6

STATE EMPLOYEES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1989

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	8	17	3					28
50-54	4	10	3		1			18
55-59	8	41	8		1			58
60-64	10	74	36	3			1	124
65-69	19	92	49	18	2		1	181
70-74	10	49	47	22	11	1	2	142
75-79	7	40	36	34	9		1	127
80-84	3	12	26	19	24	2	2	88
85+	1	12	10	14	39	2	6	84
TOTAL	70	347	218	110	87	5	13	850

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	3,311	3,410	4,452					3,494
50-54	3,378	3,566	3,463		2,198			3,431
55-59	8,360	4,414	3,135		1,389			4,729
60-64	5,338	5,504	4,711	2,925			2,072	5,170
65-69	5,514	5,226	4,956	4,013	1,939		2,055	5,009
70-74	3,255	5,147	4,981	4,879	3,278	2,024	2,069	4,707
75-79	4,726	4,311	3,493	4,518	1,933		2,125	3,972
80-84	3,554	3,750	4,510	4,662	2,102	2,419	1,567	3,635
85+	17,294	1,989	2,338	3,504	2,034	2,905	2,102	2,516
ALL	5,123	4,773	4,412	4,360	2,192	2,534	2,010	4,336

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
359	1,656	961	480	191	13	26	3,686

TABLE 7

STATE EMPLOYEES RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1988	47,040	1,162	4,084
B. Additions	5,860	446	1,212
C. Deletions:			
1. Service Retirement	(556)	(78)	(7)
2. Disability	(49)	(4)	0
3. Death	(95)	(23)	(84)
4. Terminated-Deferred	(354)		(21)
5. Terminated-Refund	(2,631)	0	(420)
6. Terminated-Other Non-vested	(902)	(1)	
7. Returned as Active		(120)	(396)
D. Data Adjustments	340	(27)	(444)
Vested	29,698		
Non-Vested	18,955		
E. Total on June 30, 1989	48,653	1,355	3,924

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1988	11,455	669	753
B. Additions	549	53	73
C. Deletions:			
1. Service Retirement		0	
2. Death	(469)	(52)	(14)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	29	(5)	38
E. Total on June 30, 1989	11,564	665	850

TABLE 8

STATE EMPLOYEES RETIREMENT FUND

ACTUARIAL BALANCE SHEET (DOLLARS IN THOUSANDS)

JULY 1, 1989

A. CURRENT ASSETS (TABLE 1, F6)			$1,871,542
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			812,955
2. Present Value of Future Normal Costs			783,198
3. Total Expected Future Assets			1,596,153
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$3,467,695
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$645,859	$645,859
b. Disability Benefits		28,098	28,098
c. Surviving Spouse and Child Benefits		40,312	40,312
2. Deferred Retirements with Future Augmentation		21,836	21,836
3. Former Members without Vested Rights		2,178	2,178
4. Active Members			
a. Retirement Annuities	11,303	926,686	937,989
b. Disability Benefits	51,126	0	51,126
c. Survivors' Benefits	60,958	0	60,958
d. Deferred Retirements	7,963	283,440	291,403
e. Refund Liability Due to Death or Withdrawal	0	29,513	29,513
5. Total Current Benefit Obligations	$131,350	$1,977,922	$2,109,272
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$1,130,612
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$3,239,884
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$237,730
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($227,811)

TABLE 9

STATE EMPLOYEES RETIREMENT FUND

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1989

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$1,763,036	$452,897	$1,310,139
b. Disability Benefits	95,505	32,750	62,755
c. Survivors Benefits	112,058	35,892	76,166
d. Deferred Retirements	479,469	185,038	294,431
e. Refunds Due to Death or Withdrawal	51,533	76,621	(25,088)
f. Total	$2,501,601	$783,198	$1,718,403
2. Deferred Retirements with Future Augmentation	$21,836		$21,836
3. Former Members Without Vested Rights	2,178		2,178
4. Annuitants in MPRIF Reserve on 6/30/89 is $701,989 without the bounce back subsidy	708,697		708,697
5. Recipients Not in MPRIF	5,572		5,572
6. Total	$3,239,884	$783,198	$2,456,686

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$2,456,686
2. Current Assets (Table 2, K3)	1,871,542
3. UAAL (B1-B2)	$585,144
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$32,260,137
2. Supplemental Contribution Rate (B3/C1)	1.81%

TABLE 10

STATE EMPLOYEES RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

A. UAAL AT BEGINNING OF YEAR	$471,331
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$67,526
2. Contribution	(90,458)
3. Interest on A, B1, and B2	36,789
4. Total (B1+B2+B3)	$13,857
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$485,188
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($30,516)
2. Investment Return	(62,984)
3. MPRIF Mortality	968
4. Mortality of Other Benefit Recipients	0
5. Other Items	34,948
6. Total	($57,584)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$427,604
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$231,167
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	($73,627)
H. UAAL AT END OF YEAR (E+F+G)	$585,144

TABLE 11

STATE EMPLOYEES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1989

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352		
1. Employee Contributions	4.34%	$61,548
2. Employer Contributions	4.51%	63,959
3. Total	8.85%	$125,507
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	3.54%	$50,417
b. Disability Benefits	0.25%	3,486
c. Survivors	0.27%	3,779
d. Deferred Retirement Benefits	1.38%	19,536
e. Refunds Due to Death or Withdrawal	0.66%	9,325
f. Total	6.10%	$86,543
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $585,144	1.81%	$25,669
3. Allowance for Expenses	0.23%	$3,262
4. Total	8.14%	$115,474
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	0.71%	$10,033

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1989 is $1,418,160

TABLE 12

STATE EMPLOYEES RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1989					$1,169,553
1990	$125,507	$51,297	$9,975	$102,142	1,335,930
1991	133,656	116,268	10,789	113,835	1,456,364
1992	142,344	83,713	11,806	125,781	1,628,970
1993	151,596	99,425	12,698	140,140	1,808,583
1994	161,450	108,896	13,933	155,371	2,002,575
1995	171,944	117,978	15,129	171,869	2,213,281
1996	183,121	131,022	16,522	189,641	2,438,499
1997	195,024	145,813	17,795	208,608	2,678,523
1998	207,700	159,149	19,113	228,926	2,936,887
1999	221,201	184,482	20,687	250,317	3,203,236
2000	235,579	202,546	22,137	272,738	3,486,870
2001	250,891	226,040	23,821	296,428	3,784,328
2002	267,199	260,581	25,493	320,866	4,086,319
2003	284,567	298,412	27,382	345,585	4,390,677
2004	303,064	340,395	29,502	370,367	4,694,211
2005	322,763	371,216	31,531	395,609	5,009,836
2006	343,743	404,174	33,771	421,832	5,337,466
2007	366,086	451,753	36,242	448,503	5,664,060
2008	389,882	492,969	38,935	475,409	5,997,447
2009	415,224	567,208	41,869	501,544	6,305,138
2010	442,214	572,292	44,930	528,499	6,658,629
2011	470,957	613,047	48,275	557,893	7,026,157
2012	501,570	645,842	51,834	588,889	7,418,940
2013	534,172	665,935	55,525	622,650	7,854,302
2014	568,893	747,466	59,382	657,503	8,273,850
2015	605,871	730,600	63,333	695,285	8,781,073
2016	645,252	728,338	67,576	739,988	9,370,399
2017	687,194	731,342	72,044	791,546	10,045,753
2018	731,861	772,798	76,598	848,894	10,777,112
2019	779,432	858,479	81,298	909,240	11,526,007
2020	830,095	884,439	87,201	973,695	12,358,157

TABLE 13

STATE EMPLOYEES RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: Effective July 1, 1989: 8.5% per annum Prior to July 1, 1989: 8.0% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 6.5% to current fiscal year and 6.5% annually for each future year. Prior fiscal year salary is annualized for new Members.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Combined Annuity Mortality Table Female - Combined Annuity Mortality Table
Retirement Age:	Graded rates beginning at age 58 as shown in rate table. Members who have attained the highest assumed retirement age will retire in one year. In addition, 25% of members are assumed to retire each year that they are eligible for the Rule of 90.
Separation:	Graded rates based on actual experience developed by the June 30, 1971 experience analysis. Rates are shown in rate table.
Disability:	Rates adopted by MSRS as shown in rate table.
Expenses:	Prior year expenses expressed as a percentage of prior year payroll. (0.23% of payroll)
Return Contributions:	All employees withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Family Composition:	85% of Members are married. Female is three years younger than male.
Social Security:	NA

TABLE 13
(cont)

Benefit Increases after Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	Married members assumed to elect subsidized joint and survivor form of annuity as follows: Males - 25% elect 50% J & S option; - 45% elect 100% J & S option; Females - 5% elect 50% J & S option; 5% elect 100% J & S option.
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method with normal costs expressed as a level percentage of earnings. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases of 6.5% per annum.
Projected Cash Flow Method:	Cash flows from the Non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition, new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

SEPARATIONS EXPRESSED AS THE NUMBER OF OCCURRENCES PER 10,000

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
20	5	4	2,400	3,700	0	0	0	0
21	5	4	2,250	3,550	0	0	0	0
22	5	4	2,080	3,390	0	0	0	0
23	6	4	1,920	3,230	0	0	0	0
24	6	4	1,760	3,070	0	0	0	0
25	6	5	1,600	2,910	0	0	0	0
26	7	5	1,470	2,750	0	0	0	0
27	7	5	1,340	2,600	0	0	0	0
28	7	5	1,230	2,430	0	0	0	0
29	8	5	1,130	2,270	0	0	0	0
30	8	5	1,040	2,120	2	0	0	0
31	9	6	950	1,970	2	0	0	0
32	9	6	890	1,820	2	0	0	0
33	10	6	830	1,680	2	0	0	0
34	10	7	770	1,540	2	0	0	0
35	11	7	720	1,410	2	1	0	0
36	12	7	680	1,300	2	1	0	0
37	13	8	640	1,190	2	1	0	0
38	14	8	600	1,090	2	1	0	0
39	15	9	560	1,000	2	2	0	0
40	16	9	530	920	2	2	0	0
41	18	10	500	850	2	2	0	0
42	20	10	480	780	2	4	0	0
43	23	11	460	720	3	4	0	0
44	26	12	430	680	3	4	0	0
45	29	13	410	630	3	5	0	0
46	33	14	390	590	5	6	0	0
47	38	15	370	560	7	7	0	0
48	42	16	350	530	9	7	0	0
49	47	18	340	500	11	10	0	0
50	53	20	320	470	14	10	0	0
51	59	23	300	440	16	12	0	0
52	65	26	280	410	20	14	0	0
53	71	29	260	390	24	16	0	0
54	78	33	240	360	28	20	0	0

TABLE 13
(cont)

Age	Death		Withdrawal		Disability		Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
55	85	38	210	330	34	24	0	0
56	93	42	170	290	40	30	0	0
57	100	47	140	230	46	36	0	0
58	109	53	90	170	56	44	50	50
59	119	59	40	90	66	52	50	50
60	131	65	0	0	76	62	150	150
61	144	71	0	0	90	74	150	150
62	159	78	0	0	110	88	500	200
63	174	85	0	0	136	104	350	350
64	192	93	0	0	174	122	1,100	1,100
65	213	100	0	0	0	0	10,000	10,000
66	236	109	0	0	0	0	0	0
67	263	119	0	0	0	0	0	0
68	292	131	0	0	0	0	0	0
69	324	144	0	0	0	0	0	0
70	361	159	0	0	0	0	0	0

TABLE 14

STATE EMPLOYEES RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	State employees, non-academic staff of the University of Minnesota, and employees of certain Metro level governmental units, unless excluded by law.
Contributions	
Member	4.34% of Salary. (Amended 1989)
Employer	4.51% of Salary. (Amended 1989)
Allowable Service	Service during which Member contributions were made. May also include certain leaves of absence, military service, and periods while temporary Worker's Compensation is paid.
Salary	Includes wages, allowances, and fees. Excludes lump sum payments at separation.
Average Salary	Average of the 5 highest successive years (60 successive months) of Salary. Average Salary is based on all Allowable Service if less than 5 years. (Amended 1989)
RETIREMENT	
Normal Retirement Benefit	
Eligibility	First hired before July 1, 1989: Age 65 and 3 years of Allowable Service. Proportionate Retirement Annuity is available at age 65 and 1 year of Allowable Service. First hired after June 30, 1989: The greater of age 65 or the age eligible for full Social Security retirement benefits and 3 years of Allowable Service. Proportionate Retirement Annuity is available at normal retirement age and 1 year of Allowable Service. (Amended 1989)
Amount	1.5% of Average Salary for each year of Allowable Service. (Amended 1989)
Early Retirement Benefit	
Eligibility	First hired before July 1, 1989: Age 55 and 3 years of Allowable Service. Any age with 30 years of Allowable Service. Rule of 90: Age plus Allowable Service totals 90. (Amended 1989)

	First hired after June 30, 1989: Age 55 with 3 years of Allowable Service. (Amended 1989)
Amount	First hired before July 1, 1989: The greater of 1% of Average Salary for each of the first 10 years of Allowable Service and 1.5% of Average Salary for each subsequent year with reduction of 0.25% for each month the Member is under age 65 at time of retirement (age 62 if 30 years of Allowable Service). No reduction if age plus years of Allowable Service totals 90. or 1.5% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3% per year and actuarial reduction for each month the Member is under age 65. (Amended 1989)
	First hired after June 30, 1989: 1.5% of Average Salary for each year of Allowable Service assuming augmentation to the age eligible for full Social Security retirement benefits at 3% per year and actuarial reduction for each month the Member is under the Social Security retirement age. (Amended 1989)
Form of Payment	Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are: 50% or 100% joint and survivor with bounce back feature without additional reduction (option is cancelled if Member is pre-deceased by beneficiary). 15 year certain and life thereafter. (Amended 1989)
Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF). A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Benefit recipients receiving benefits for at least 1 full month but less than 12 months will receive a partial increase. (Amended 1989)

TABLE 14
(cont)

Members retired under law in effect before July 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is $25 times each full year of Allowable Service or $400 per full year of service less any Social Security benefits received or annuity from a Minnesota public employee pension plan. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from MPRIF. (Amended 1989)

DISABILITY	
Disability Benefit	
Eligibility	Total and permanent disability before normal retirement age with 3 years of Allowable Service. (Amended 1989)
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age. Payments stop at normal retirement age, or earlier if disability ceases or death occurs. Benefits may be reduced on resumption of partial employment.
Form of Payment	Same as for retirement.
Benefit Increases	Same as for retirement.
Retirement After Disability	
Eligibility	Normal retirement age with continued disability.
Amount	Any optional annuity continues. Otherwise a normal retirement benefit equal to the disability benefit paid before normal retirement age, or an actuarially equivalent optional annuity.
Benefit Increases	Same as for retirement.
DEATH	
Surviving Spouse Optional Annuity	
Eligibility	Member or former Member who dies before retirement or disability benefits commence, if age 50 with 3 years of Allowable Service or any age with 30 years of Allowable Service. If the Member dies before age 55 and has less than 30 years of Allowable Service, benefits commence when Member would have been age 55. (Amended 1989)

TABLE 14
(cont)

Amount	Surviving spouse receives the 100% joint and survivor benefit the Member could have elected if terminated. In lieu of this benefit the surviving spouse may elect a refund of contributions with interest.
Benefit Increases	Same as for retirement.
Refund of Contributions	
Eligibility	Active employee dies and survivor benefits are not payable, or a former employee dies before annuity begins, or a former employee who is not entitled to an annuity dies.
Amount	The Member's contributions with 5% interest if death occurred before May 16, 1989, and 6% interest if death occurred on or after May 16, 1989. (Amended 1989)
Eligibility	Retired or disabled annuitant who did not select an optional annuity dies, or the remaining recipient of an option dies.
Amount	The excess of the Member's contributions over all benefits paid.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of state service.
Amount	Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989, and 6% interest compounded annually if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund. (Amended 1989)
Deferred Benefit	
Eligibility	3 years of Allowable Service. (Amended 1989)
Amount	Benefit computed under law in effect at termination and increased by the following annual percentage: 0% before 7/1/71, 5% from 7/1/71 to 1/1/81, and 3% thereafter until January 1 of the year following attainment of age 55 and 5% thereafter until the annuity begins. Amount is payable as a normal or early retirement. (Amended 1989)

TABLE 15

STATE EMPLOYEES RETIREMENT FUND

MILITARY AFFAIRS CALCULATION

Section 352.85 of Chapter 352 of Minnesota Statutes provides that certain military affairs personnel may retire, with an unreduced benefit, at age 60. In addition, they may receive disability benefits upon being found disqualified for retention in active military duty. To fund these special benefits, employees and employer contribute an extra 1.6% of payroll.

To recognize the effect of the unreduced early retirement benefit available at age 60, we have assumed that all military affairs personnel will retire at age 60, or if over age 60, one year from the valuation date.

The results of our calculations are as follows:

1.	Number of Active Members	5
2.	Projected Annual Earnings	$215,574
3.	Normal Cost	
	a. Dollar Amount	$ 15,457
	b. Percent of Payroll	7.17%

TABLE 16

STATE EMPLOYEES RETIREMENT FUND

PILOTS CALCULATION

Section 352.86 of Chapter 352 of Minnesota Statutes provides that certain transportation department pilots may retire, with an unreduced benefit, at age 62. In addition, they may receive disability benefits upon being found disqualified for retention as pilots. To fund these special benefits, employees and employer contribute an extra 1.6% of payroll.

To recognize the effect of the unreduced early retirement benefit available at age 62, we have assumed that all pilots will retire at age 62, or if over age 62, one year from the valuation date.

The results of our calculations are as follows:

1. Number of Active Members	5
2. Projected Annual Earnings	$257,384
3. Normal Cost	
a. Dollar Amount	$ 22,341
b. Percent of Payroll	8.68%

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1989

THE Wyatt COMPANY

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

15TH FLOOR
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 7, 1989

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: CORRECTIONAL EMPLOYEES RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1989 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on September 20, 1989.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, FSA
Actuary

CORRECTIONAL EMPLOYEES RETIREMENT FUND

TABLE OF CONTENTS

CORRECTIONAL EMPLOYEES RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/88 VALUATION	07/01/89 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352 % of Payroll	13.60%	13.60%
2. Required Contributions - Chapter 356 % of Payroll	10.37%	10.87%
3. Sufficiency (Deficiency) (A1-A2)	3.23%	2.73%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	$74,065	$85,441
b. Current Benefit Obligations (Table 8)	$69,142	$79,143
c. Funding Ratio (a/b)	107.12%	107.96%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	$74,065	$85,441
b. Actuarial Accrued Liability (Table 9)	$81,454	$92,684
c. Funding Ratio (a/b)	90.93%	92.19%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$143,306	$154,739
b. Current and Expected Future Benefit Obligations	$114,417	$128,657
c. Funding Ratio (a/b)	125.25%	120.27%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	1,267	1,317
b. Projected Annual Earnings	$38,807	$41,976
c. Average Annual Earnings (Actual $)	$30,629	$31,872
d. Average Age	37.4	37.6
e. Average Service	8.0	8.2
2. Others		
a. Service Retirements (Table 4)	328	337
b. Disability Retirements (Table 5)	6	8
c. Survivors (Table 6)	12	12
d. Deferred Retirements (Table 7)	47	58
e. Terminated Other Non-vested (Table 7)	80	57
f. Total	473	472

CORRECTIONAL EMPLOYEES RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions for the Correctional Employees Retirement Fund are sufficient for 1989 by an amount of 2.73% of payroll. According to this valuation a contribution rate of 10.87% is required to comply with Minnesota Law.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 107.96%. The corresponding ratio for the prior year was 107.12%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used. For 1989 the ratio is 92.19%, which is an increase from the 1988 value of 90.93%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This ratio, which is more than 100%, verifies that the current statutory contributions are adequate.

Asset Information (Tables 1 and 2)

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value of the Assets Available for Benefits and one-third of the difference between the market value and cost value of those assets.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1990 when benefits will be increased for those annuitants who have been receiving payments for at least 7 months. Next year's valuation will include the 1990 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the excess earnings for the January benefit increase as well as the Fund's allocated market share of MPRIF. An approximation of those values on June 30, 1989 is provided below:

MPRIF Reserves	$28,364,000
Reserves Plus Excess Earnings	29,400,000
MPRIF Market Value	31,900,000

Membership Data (Tables 3, 4, 5, 6 and 7)

Tables 3 through 6 summarize statistical information about members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year except in the case of new hires whose earnings have been annualized.

The service retirements in Table 4 include not only those retiring from active status but also disabled members who have attained age 62. Disabled members under age 62 are shown in Table 5. The survivors category (Table 6) includes spouses and children of deceased members. The annual annuities shown in Table 4 and Table 6 represent the amount that is payable after 84 months, or age 65 if earlier.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited

Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The July 1, 1989 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table. This table shows the impact of the changes in plan provisions on the liabilities under the old actuarial assumptions. See page 9 for an explanation of the changes in plan provisions.

	Old Benefits	New Benefits
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$31,407,000	$31,535,000
Current Employees -		
Accumulated employee contributions including allocated investment income	14,839,000 *	15,706,000 *
Employer-financed vested	27,202,000	31,447,000
Employer-financed nonvested	3,764,000	3,301,000
Total Pension Benefit Obligation	$77,212,000	$81,989,000

* Estimated

The following table shows the impact of the change in actuarial assumptions using the new plan provisions. See page 11 for an explanation of the change in actuarial assumptions.

	Old Assumptions	New Assumptions
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$31,535,000	$31,492,000
Current Employees -		
Accumulated employee contributions including allocated investment income	15,706,000 *	15,706,000 *
Employer-financed vested	31,447,000	28,846,000
Employer-financed nonvested	3,301,000	3,099,000
Total Pension Benefit Obligation	$81,989,000	$79,143,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) illustrates the two techniques for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- A gain from salaries where the average increase was 5.1% compared to the expected 6.5%.

- A gain from Current Assets because the return was 14.2% instead of the assumed 8%.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- Normal Costs based on the Entry Age Normal Actuarial Cost Method

- A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability

- An Allowance for Expenses

Table 11 shows the Fund has a contribution sufficiency since the Statutory Contribution Rate is 13.60% compared to the Required Contribution Rate of 10.87%.

Projected Cash Flow (Table 12)

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rates for employees. As members become eligible for payments from MPRIF an amount of reserve is transferred to SBI. The other disbursements represent benefit payments made directly by the Fund. This projected cash flow assumes that future payrolls increase by 6.5%. Table 12 is the only table in this report where new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8.5% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year. The amount for 1991 is large because it includes those already over age 58 who are assumed to retire a year from the valuation date.

Changes in Plan Provisions

There were numerous changes in benefits in 1989 that are recognized in the July 1, 1989 actuarial valuation. The significant changes in benefits are summarized below.

- The service requirement for the normal retirement benefit, surviving spouse annuity and deferred benefit was reduced from 5 years to 3 years.

- The benefit formula was changed from 2.5% of average salary for the first 25 years of service and 2% of average salary for each additional year (maximum of 75% of average salary) to a level 2.5% of average salary for each year of service (maximum of 75% of average salary).

- Early retirement is now allowed at age 50 and 5 years of service. The early retirement benefit is the actuarial equivalent of the normal retirement benefit payable at age 55.

- The occupational disability benefit was changed to be equal to 50% of average salary plus 2.5% of average salary for each year of service in excess of 20 years of service.

- The service requirement for the non-occupational disability benefit was reduced from 5 years to 1 year. The benefit formula was changed to be equal to the normal retirement benefit based on a minimum of 15 years of service.

- The interest rate credited on refund of member contributions was increased from 5% to 6%.

- The joint and survivor annuity option now provides a bounce back feature without additional reduction.

	Impact Due To Changes In Plan Provisions
Actuarial Accrued Liability	$6,390,000
Projected Benefit Obligation for GASB No. 5	4,777,000
Normal Cost	1.22%
Supplemental Contribution	.63%
Required Contribution	1.85%

Changes in Actuarial Assumptions

The pre-retirement interest rate assumption has been increased from 8.0% to 8.5%. Also, the amortization target date has been changed to July 1, 2020.

	Impact Due To Changes In Actuarial Assumptions	
	Interest Rate Change	Amortization Date Change
Actuarial Accrued Liability	$(2,901,000)	$0,000,000
Projected Benefit Obligation for GASB No. 5	(2,846,000)	0,000,000
Normal Cost	(.78%)	.00%
Supplemental Contribution	(.25%)	(.02%)
Required Contribution	(1.03%)	(.02%)

TABLE 1

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1989

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$1,671	$1,671
2. Investments		
a. Fixed Income	12,947	12,756
b. Equity	41,818	36,270
c. Real Estate	4,965	4,002
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	28,364	28,364
4. Other	232	232
B. TOTAL ASSETS	$89,997	$83,295
C. AMOUNTS CURRENTLY PAYABLE	$88	$88
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$12,053	$12,053
2. Employer Reserves	49,492	42,790
3. MPRIF Reserves	28,364	28,364
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	$89,909	$83,207
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$89,997	$83,295

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$83,207
2. Market Value (D5)	$89,909	
3. Cost Value (D5)	83,207	
4. Market Over Cost (F2-F3)	$6,702	
5. 1/3 of Market Over Cost(F4)/3		2,234
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$85,441

TABLE 2

CORRECTIONAL EMPLOYEES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS AND ASSET ALLOCATION (DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	$77,302	$72,446
B. OPERATING REVENUES		
1. Member Contributions	$1,748	$1,748
2. Employer Contributions	3,084	3,084
3. Investment Income	5,387	5,387
4. MPRIF Income	2,897	2,897
5. Net Realized Gain (Loss)	970	970
6. Other	0	0
7. Net Change in Unrealized Gain (Loss)	1,846	0
8. Total Revenue	$15,932	$14,086
C. OPERATING EXPENSES		
1. Service Retirements	$2,876	$2,876
2. Disability Benefits	88	88
3. Survivor Benefits	0	0
4. Refunds	270	270
5. Expenses	147	147
6. Other	31	31
7. Total Disbursements	$3,412	$3,412
D. OTHER CHANGES IN RESERVES	87	87
E. ASSETS AVAILABLE AT END OF YEAR	$89,909	$83,207

TABLE 3

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1989

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	30	33	1						64
25-29	40	116	64	1					221
30-34	17	77	136	42					272
35-39	12	49	89	106	19				275
40-44	9	35	68	61	43	6	1		223
45-49	5	13	28	40	12	21	4		123
50-54	2	11	14	27	22	15	10	3	104
55-59	1	3	5	7	7	4		1	28
60-64			1	3	1	1	1		7
65+									0
TOTAL	116	337	406	287	104	47	16	4	1,317

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	11,322	20,324	26,221						16,196
25-29	17,681	23,048	27,531	29,498					23,404
30-34	18,212	24,710	28,805	32,158					27,502
35-39	14,207	25,230	29,014	31,712	34,096				29,085
40-44	17,144	24,019	29,433	31,935	35,446	34,239	25,735		30,044
45-49	18,954	27,525	28,327	32,500	34,409	34,806	28,685		30,929
50-54	20,650	28,285	30,000	32,351	35,943	32,839	33,518	32,980	32,340
55-59	14,786	30,706	32,338	31,684	37,573	41,161		41,018	34,252
60-64			37,532	31,648	31,090	35,391	21,733		31,527
65+									0
ALL	15,794	23,991	28,822	31,985	35,286	34,659	31,087	34,990	27,893

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
1,832	8,085	11,702	9,180	3,670	1,629	497	140	36,735

TABLE 4

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1989

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59	15	43						58
60-64	2	10	62					74
65-69	1	5	28	48				82
70-74			9	67	2			78
75-79				39	5			44
80-84					1			1
85+								0
TOTAL	18	58	99	154	8	0	0	337

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59	7,844	8,284						8,170
60-64	3,500	7,933	8,739					8,488
65-69	8,260	5,729	6,945	6,979				6,907
70-74			4,480	5,557	5,436			5,429
75-79				4,187	6,161			4,411
80-84					3,771			3,771
85+								0
ALL	7,384	8,003	7,844	5,653	5,681	0	0	6,794

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
133	464	777	871	45	0	0	2,290

TABLE 5

CORRECTIONAL EMPLOYEES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1989

AGE	YEARS DISABLED ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	3		1					4
50-54	1	1						2
55-59			1					1
60-64			1					1
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	4	1	3	0	0	0	0	8

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	4,327		3,348					4,082
50-54	2,898	5,798						4,348
55-59			3,124					3,124
60-64			12,731					12,731
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	3,970	5,798	6,401	0	0	0	0	5,110

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
16	6	19	0	0	0	0	41

TABLE 6

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1989

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		2						2
50-54			1					1
55-59		2	1					3
60-64								0
65-69		2	1	1				4
70-74			1					1
75-79				1				1
80-84								0
85+								0
TOTAL	0	6	4	2	0	0	0	12

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		2,968						2,968
50-54			21,399					21,399
55-59		5,105	5,522					5,244
60-64								0
65-69		2,417	5,070	4,150				3,514
70-74			3,566					3,566
75-79				4,741				4,741
80-84								0
85+								0
ALL	0	3,497	8,889	4,446	0	0	0	5,452

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	21	35	9	0	0	0	65

TABLE 7

CORRECTIONAL EMPLOYEES RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1988	1,267	47	80
B. Additions	130	17	15
C. Deletions:			
1. Service Retirement	(19)	(2)	
2. Disability	(4)		
3. Death	(3)	0	(2)
4. Terminated-Deferred	(11)		(1)
5. Terminated-Refund	(48)	0	(5)
6. Terminated-Other Non-vested	(11)		
7. Returned as Active		(4)	(4)
D. Data Adjustments	16	0	(26)
Vested	864		
Non-Vested	453		
E. Total on June 30, 1989	1,317	58	57

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1988	328	6	12
B. Additions	20	4	0
C. Deletions:			
1. Service Retirement		(1)	
2. Death	(11)	(1)	0
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	0	0	0
E. Total on June 30, 1989	337	8	12

TABLE 8

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1989

A. CURRENT ASSETS (TABLE 1, F6)			$85,441
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			33,325
2. Present Value of Future Normal Costs			35,973
3. Total Expected Future Assets			69,298
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$154,739
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$26,763	$26,763
b. Disability Benefits		822	822
c. Surviving Spouse and Child Benefits		907	907
2. Deferred Retirements with Future Augmentation		2,828	2,828
3. Former Members without Vested Rights		172	172
4. Active Members			
a. Retirement Annuities	418	31,285	31,703
b. Disability Benefits	979	0	979
c. Survivors' Benefits	1,356	0	1,356
d. Deferred Retirements	346	12,428	12,774
e. Refund Liability Due to Death or Withdrawal	0	839	839
5. Total Current Benefit Obligations	$3,099	$76,044	$79,143
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$49,514
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$128,657
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			($6,298)
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($26,082)

TABLE 9

CORRECTIONAL EMPLOYEES RETIREMENT FUND

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1989

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$68,397	$21,736	$46,661
b. Disability Benefits	1,879	787	1,092
c. Survivors Benefits	2,706	915	1,791
d. Deferred Retirements	22,766	10,478	12,288
e. Refunds Due to Death or Withdrawal	1,417	2,057	(640)
f. Total	$97,165	$35,973	$61,192
2. Deferred Retirements with Future Augmentation	$2,828		$2,828
3. Former Members Without Vested Rights	172		172
4. Annuitants in MPRIF Reserve on 6/30/89 is $28,364 without the bounce back subsidy	28,492		28,492
5. Recipients Not in MPRIF	0		0
6. Total	$128,657	$35,973	$92,684
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			$92,684
2. Current Assets (Table 1, F6)			85,441
3. UAAL (B1-B2)			$7,243
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020			$954,857
2. Supplemental Contribution Rate (B3/C1)			0.76%

TABLE 10

CORRECTIONAL EMPLOYEES RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

A. UAAL AT BEGINNING OF YEAR	$7,389
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$3,403
2. Contribution	(4,832)
3. Interest on A, B1, and B2	534
4. Total (B1+B2+B3)	($895)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$6,494
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($265)
2. Investment Return	(3,031)
3. MPRIF Mortality	(69)
4. Mortality of Other Benefit Recipients	0
5. Other Items	625
6. Total	($2,740)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$3,754
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$6,390
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	($2,901)
H. UAAL AT END OF YEAR (E+F+G)	$7,243

TABLE 11

CORRECTIONAL EMPLOYEES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1989

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352		
1. Employee Contributions	4.90%	$2,057
2. Employer Contributions	8.70%	3,652
3. Total	13.60%	$5,709
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	5.98%	$2,515
b. Disability Benefits	0.22%	91
c. Survivors	0.25%	103
d. Deferred Retirement Benefits	2.72%	1,141
e. Refunds Due to Death or Withdrawal	0.53%	223
f. Total	9.70%	$4,073
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $7,243	0.76%	$319
3. Allowance for Expenses	0.41%	$172
4. Total	10.87%	$4,564
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	2.73%	$1,145

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1989 is $41,976

TABLE 12

CORRECTIONAL EMPLOYEES RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1989					$57,077
1990	$5,709	$825	$326	$5,045	66,680
1991	6,080	3,583	338	5,760	74,599
1992	6,475	454	362	6,581	86,839
1993	6,896	3,560	391	7,506	97,290
1994	7,344	4,097	427	8,390	108,500
1995	7,821	3,652	471	9,380	121,578
1996	8,330	4,518	520	10,474	135,344
1997	8,871	4,656	566	11,659	150,652
1998	9,448	3,824	603	13,019	168,692
1999	10,062	5,834	646	14,491	186,765
2000	10,716	4,716	696	16,100	208,169
2001	11,413	5,996	749	17,893	230,730
2002	12,154	8,306	800	19,742	253,520
2003	12,944	9,715	859	21,650	277,540
2004	13,786	10,358	920	23,697	303,745
2005	14,682	15,244	989	25,752	327,946
2006	15,636	15,388	1,059	27,841	354,976
2007	16,653	13,581	1,142	30,255	387,161
2008	17,735	17,394	1,227	32,871	419,146
2009	18,888	17,132	1,311	35,646	455,237
2010	20,115	19,255	1,400	38,672	493,369
2011	21,423	21,523	1,495	41,869	533,643
2012	22,815	19,713	1,589	45,424	580,580
2013	24,298	22,808	1,696	49,341	629,715
2014	25,878	21,911	1,806	53,618	685,494
2015	27,560	22,779	1,919	58,389	746,745
2016	29,351	23,611	2,036	63,631	814,080
2017	31,259	28,346	2,159	69,229	884,063
2018	33,291	27,477	2,288	75,295	962,884
2019	35,455	26,970	2,430	82,102	1,051,041
2020	34,185	26,770	2,557	89,545	1,145,444

TABLE 13

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: Effective July 1, 1989: 8.5% per annum Prior to July 1, 1989: 8.0% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 6.5% to current fiscal year and 6.5% annually for each future year. Prior fiscal year salary is annualized for new Members.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Combined Annuity Mortality Table Female - Combined Annuity Mortality Table
Retirement Age:	Age 58, or if over age 58, one year from the valuation date.
Separation:	Graded rates based on actual experience developed by the June 30, 1971 experience analysis. Rates are shown in rate table.
Disability:	Rates adopted by MSRS as shown in rate table.
Expenses:	Prior year expenses expressed as a percentage of prior year payroll. (0.41% of payroll)
Return of Contributions:	All employees withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Family Composition:	85% of Members are married. Female is three years younger than male.

TABLE 13
(cont)

Social Security:	Based on the present law and 6.5% salary scale. Only earnings history while in state service is used. Future Social Security benefits replace the same proportion of salary as at present.
Benefit Increases after Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	Married members assumed to elect subsidized joint and survivor form of annuity as follows: Males - 25% elect 50% J & S option; - 25% elect 100% J & S option; Females - 5% elect 50% J & S option; - 5% elect 100% J & S option.
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method with normal costs expressed as a level percentage of earnings. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases of 6.5% per annum.
Projected Cash Flow Method:	Cash flows from the Non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition, new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

SEPARATIONS EXPRESSED AS THE NUMBER OF OCCURRENCES PER 10,000

	Death		Withdrawal		Disability		Retirement	
Age	Male	Female	Male	Female	Male	Female	Male	Female
20	5	4	2,400	3,700	0	0	0	0
21	5	4	2,250	3,550	0	0	0	0
22	5	4	2,080	3,390	0	0	0	0
23	6	4	1,920	3,230	0	0	0	0
24	6	4	1,760	3,070	0	0	0	0
25	6	5	1,600	2,910	0	0	0	0
26	7	5	1,470	2,750	0	0	0	0
27	7	5	1,340	2,600	0	0	0	0
28	7	5	1,230	2,430	0	0	0	0
29	8	5	1,130	2,270	0	0	0	0
30	8	5	1,040	2,120	2	0	0	0
31	9	6	950	1,970	2	0	0	0
32	9	6	890	1,820	2	0	0	0
33	10	6	830	1,680	2	0	0	0
34	10	7	770	1,540	2	0	0	0
35	11	7	720	1,410	2	1	0	0
36	12	7	680	1,300	2	1	0	0
37	13	8	640	1,190	2	1	0	0
38	14	8	600	1,090	2	1	0	0
39	15	9	560	1,000	2	2	0	0
40	16	9	530	920	2	2	0	0
41	18	10	500	850	2	2	0	0
42	20	10	480	780	2	4	0	0
43	23	11	460	720	3	4	0	0
44	26	12	430	680	3	4	0	0
45	29	13	410	630	3	5	0	0
46	33	14	390	590	5	6	0	0
47	38	15	370	560	7	7	0	0
48	42	16	350	530	9	7	0	0
49	47	18	340	500	11	10	0	0
50	53	20	320	470	14	10	0	0
51	59	23	300	440	16	12	0	0
52	65	26	280	410	20	14	0	0
53	71	29	260	390	24	16	0	0
54	78	33	240	360	28	20	0	0

TABLE 13
(cont)

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
55	85	38	210	330	34	24	0	0
56	93	42	170	290	40	30	0	0
57	100	47	140	230	46	36	0	0
58	109	53	90	170	56	44	10,000	10,000
59	119	59	40	90	66	52	0	0
60	131	65	0	0	76	62	0	0
61	144	71	0	0	90	74	0	0
62	159	78	0	0	110	88	0	0
63	174	85	0	0	136	104	0	0
64	192	93	0	0	174	122	0	0
65	213	100	0	0	0	0	0	0
66	236	109	0	0	0	0	0	0
67	263	119	0	0	0	0	0	0
68	292	131	0	0	0	0	0	0
69	324	144	0	0	0	0	0	0
70	361	159	0	0	0	0	0	0

TABLE 14

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	State employees in covered correctional service.
Contributions Member	4.90% of Salary.
Employer	8.70% of Salary.
Allowable Service	Service during which Member contributions were made. May also include certain leaves of absence, military service, and periods while temporary Worker's Compensation is paid.
Salary	Includes wages, allowances, and fees. Excludes lump sum payments at separation and reduced Salary while receiving Worker's Compensation benefits.
Average Salary	Average of the 5 highest successive years of Salary. Average Salary is based on all years of Allowable Service if less than 5 years. (Amended 1989)
RETIREMENT Normal Retirement Benefit Eligibility	Age 55 and 3 years of Allowable Service under the Correctional and General Plans. Proportionate Retirement Annuity is available at age 65 and 1 year of Allowable Service. (Amended 1989)
Amount	2.5% of Average Salary for each year of Allowable Service, pro rata for completed months. Maximum of 75% of Average Salary. (Amended 1989) After 84 months or normal retirement age if earlier, benefit changes to unreduced General Plan benefit. For Members hired prior to July 1, 1989 normal retirement age is 65; for Members hired after June 30, 1989 normal retirement age is the age first eligible for nonreduced Social Security benefits. If combined General Plan benefit and Social Security (based on State service) are less than the Correctional benefit then an additional benefit will be paid to prevent a decrease.
Early Retirement Benefit Eligibility	Age 50 and 5 years of Allowable Service. (Amended 1989)

TABLE 14
(Cont)

Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date reduced to the actuarial equivalent of the benefit that would be payable if the member deferred the benefit until age 55. (Amended 1989)
Form of Payment	Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are: 50% or 100% joint and survivor with bounce back feature without additional reduction (option cancelled if Member is pre-deceased by beneficiary) 15 year certain and life benefits (Amended 1989)
Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF). A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Benefit recipients receiving benefits for at least 1 full month but less than 12 full months will receive a partial increase. (Amended 1989)
DISABILITY	
Occupational Disability	
Eligibility	Member under age 55 who cannot perform his duties as a direct result of a disability related to an act of duty.
Amount	50% of Average Salary plus 2.5% of Average Salary for each year in excess of 20 years of Allowable Service pro rata for completed months. Maximum of 75% of Average Salary. (Amended 1989) Payment begins at disability and stops at age 62 or earlier if disability ceases or death occurs. Benefits may be paid upon reemployment but salary plus benefit cannot exceed current salary of position held at time of disability.
Non-Occupational Disability	
Eligibility	Under age 55 with at least 1 year of Correctional service and disability not related to covered employment. (Amended 1989)
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 15 years) and Average Salary at disability. (Amended 1989)

TABLE 14
(Cont)

	Payment begins at disability and ends at age 62 or earlier if disability ceases or death occurs. Benefits may be paid upon reemployment but salary plus benefit cannot exceed current salary of position held at time of disability.
Form of Payment	Same as for retirement.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Retirement Benefits	
Eligibility	Age 62 with continued disability.
Amount	Benefit computed as a normal retirement benefit under General Plan based on same Allowable Service and without reduction for age.
Form of Payment	Same as for retirement.
Benefit Increases	Same as for retirement.
DEATH	
Surviving Spouse Benefit	
Eligibility	Member or former Member who dies before retirement or disability benefits commence, if age 50 with 3 years of Allowable Service or any age with 30 years of Allowable Service. If the Member dies before age 55, benefits commence when Member would have been 55. (Amended 1989)
Amount	Surviving spouse receives the General Plan 100% joint and survivor benefit the Member could have elected if terminated. In lieu of this benefit the surviving spouse may elect a refund of contributions with interest.
Benefit Increases	Adjusted by MSRS to provide same income as MPRIF.
Refund of Contributions with Interest	
Eligibility	Active employee dies and survivor benefits are not payable, or a former employee dies before annuity begins.
Amount	The Member's contributions with 5% interest if death occurred before May 16, 1989, and 6% interest if death occurred on or after May 16, 1989. (Amended 1989)

TABLE 14
(Cont)

TERMINATION	
Refund of Contributions	
Eligibility	Termination of state service.
Amount	Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989, and 6% interest compounded annually if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund. (Amended 1989)
Deferred Annuity	
Eligibility	3 years of Correctional and General Service. (Amended 1989)
Amount	Benefit computed under law in effect at termination.

STATE PATROL RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1989

THE *Wyatt* COMPANY

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

15TH FLOOR
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 7, 1989

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: STATE PATROL RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1989 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on September 20, 1989.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Rober E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, FSA
Actuary

STATE PATROL RETIREMENT FUND

TABLE OF CONTENTS

STATE PATROL RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/88 VALUATION	07/01/89 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352B % of Payroll	27.40%	27.40%
2. Required Contributions - Chapter 356 % of Payroll	23.87%	21.84%
3. Sufficiency (Deficiency) (A1-A2)	3.53%	5.56%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$148,355	$167,271
b. Current Benefit Obligations (Table 8)	$167,349	$184,250
c. Funding Ratio (a/b)	88.65%	90.78%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$148,355	$167,271
b. Actuarial Accrued Liability (Table 9)	$175,062	$194,434
c. Funding Ratio (a/b)	84.74%	86.03%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$259,582	$304,877
b. Current and Expected Future Benefit Obligations	$241,433	$263,684
c. Funding Ratio (a/b)	107.52%	115.62%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	740	765
b. Projected Annual Earnings	$29,267	$32,591
c. Average Annual Earnings (Actual $)	$39,550	$42,603
d. Average Age	40.6	40.7
e. Average Service	14.0	14.0
2. Others		
a. Service Retirements (Table 4)	339	340
b. Disability Retirements (Table 5)	13	14
c. Survivors (Table 6)	103	101
d. Deferred Retirements (Table 7)	16	19
e. Terminated Other Non-vested (Table 7)	8	7
f. Total	479	481

STATE PATROL RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions for the State Patrol Retirement Fund continue to be sufficient. The margin of sufficiency has increased from 3.53% in 1988 to 5.56% in 1989. According to this valuation a contribution rate of 21.84% is required to comply with Minnesota Law.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 90.78%. The corresponding ratio for the prior year was 88.65%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used. For 1989 the ratio is 86.03%, which is an increase from the 1988 value of 84.74%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This ratio exceeds 100% and verifies that the current statutory contributions are adequate.

Asset Information (Tables 1 and 2)

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value of the Assets Available for Benefits and one-third of the difference between the market value and cost value of those assets.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1990 when benefits will be increased for those annuitants who have been receiving payments for at least 7 months. Next year's valuation will include the 1990 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the excess earnings for the January benefit increase as well as the Fund's allocated market share of MPRIF. An approximation of those values on June 30, 1989 is provided below:

MPRIF Reserves	$78,463,000
Reserves Plus Excess Earnings	81,400,000
MPRIF Market Value	88,400,000

Membership Data (Tables 3, 4, 5, 6 and 7)

Tables 3 through 6 summarize statistical information about members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year except in the case of new hires whose earnings have been annualized.

The service retirements in Table 4 include not only those retiring from active status but also disabled members who have attained retirement age. Disabled members under retirement age are shown in Table 5. The survivors category (Table 6) includes spouses and children of deceased members.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current

Benefit Obligation".

The July 1, 1989 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table. This table shows the impact of the changes in plan provisions on the liabilities under the old actuarial assumptions. See page 9 for an explanation of the changes in plan provisions.

	Old Benefits	New Benefits
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$88,089,000	$89,280,000
Current Employees -		
Accumulated employee contributions including allocated investment income	27,059,000 *	29,854,000 *
Employer-financed vested	55,567,000	57,309,000
Employer-financed nonvested	12,564,000	12,725,000
Total Pension Benefit Obligation	$183,279,000	$189,168,000

* Estimated

The following table shows the impact of the change in actuarial assumptions using the new plan provisions. See page 11 for an explanation of the change in actuarial assumptions.

	Old Assumptions	New Assumptions
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$89,280,000	$89,239,000
Current Employees -		
Accumulated employee contributions including allocated investment income	29,854,000 *	29,854,000 *
Employer-financed vested	57,309,000	52,924,000
Employer-financed nonvested	12,725,000	12,233,000
Total Pension Benefit Obligation	$189,168,000	$184,250,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) illustrates the two techniques for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- o A gain from salaries where the average increase was 8.8% compared to the expected 6.5%.

- o A gain from Current Assets because the return was 13.9% instead of the assumed 8%.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- o Normal Costs based on the Entry Age Normal Actuarial Cost Method

- o A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability

- o An Allowance for Expenses

Table 11 shows the Fund has a contribution sufficiency since the Statutory Contribution Rate is 27.40% compared to the Required Contribution Rate of 21.84%.

Projected Cash Flow (Table 12)

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rates for employees. As members become eligible for payments from MPRIF an amount of reserve is transferred to SBI. The other disbursements represent benefit payments made directly by the Fund. This projected cash flow assumes that future payrolls increase by 6.5%. Table 12 is the only table in this report where new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8.5% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year. The amount for 1991 is large because it includes those already over age 58 who are assumed to retire a year from the valuation date.

Changes in Plan Provisions

There were numerous changes in benefits in 1989 that are recognized in the July 1, 1989 actuarial valuation. The significant changes in benefits are summarized below:

- The service requirement for the normal retirement benefit, surviving spouse annuity and deferred benefit was reduced from 5 years to 3 years.

- The benefit formula changed from 2.5% of average salary for the first 25 years of service and 2% of average salary for each additional year to a level 2.5% of average salary for each year of service.

- Early retirement is now allowed at age 50 and 5 years of service. The early retirement benefit is the actuarial equivalent of the normal retirement benefit payable at age 55.

- The service requirement for the non-duty disability benefit was reduced from 5 years to 1 year. The benefit formula was changed to be equal to the normal retirement benefit based on a minimum of 15 years of service.

- The surviving spouse benefit for members under age 55 or with less than 3 years of service was changed from 20% of annual salary to 50% of annual salary.

- The surviving dependent children's benefit was changed from a maximum of 40% of average salary to a minimum of 50% and a maximum of 70% of average salary. The eligible age for full-time students was increased from 22 to 23.

- The interest rate credited on refund of member contributions was increased from 5% to 6%.

- The joint and survivor annuity option now provides a bounce back feature without additional reduction.

	Impact Due to To Changes In Plan Provisions
Actuarial Accrued Liability	$6,045,000
Projected Benefit Obligation for GASB No. 5	5,889,000
Normal Cost	.98%
Supplemental Contribution	.88%
Required Contribution	1.86%

Changes in Actuarial Assumptions

The pre-retirement interest rate assumption has been increased from 8.0% to 8.5%. Also, the amortization target date has been changed to July 1, 2020.

	Impact Due To Changes In Actuarial Assumptions	
	Interest Rate Change	Amortization Date Change
Actuarial Accrued Liability	($3,356,000)	$0,000,000
Projected Benefit Obligation for GASB No. 5	(4,918,000)	0,000,000
Normal Cost	(1.46%)	.00%
Supplemental Contribution	(.36%)	(1.31%)
Required Contribution	(1.82%)	(1.31%)

TABLE 1

STATE PATROL RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1989

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$2,499	$2,499
2. Investments		
a. Fixed Income	20,131	19,883
b. Equity	65,021	57,059
c. Real Estate	7,720	6,220
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	78,463	78,463
4. Other	263	263
B. TOTAL ASSETS	$174,097	$164,387
C. AMOUNTS CURRENTLY PAYABLE	$353	$353
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$19,583	$19,583
2. State Reserves	67,442	57,732
3. MPRIF Reserves	78,463	78,463
4. Non-MPRIF Reserves	8,256	8,256
5. Total Assets Available for Benefits	$173,744	$164,034
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$174,097	$164,387

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$164,034
2. Market Value (D5)	$173,744	
3. Cost Value (D5)	164,034	
4. Market Over Cost (F2-F3)	$9,710	
5. 1/3 of Market Over Cost(F4)/3		3,237
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$167,271

TABLE 2

STATE PATROL RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$152,929	$146,068
B. OPERATING REVENUES		
1. Member Contributions	$2,367	$2,367
2. Employer Contributions	5,256	5,256
3. Investment Income	8,316	8,316
4. MPRIF Income	8,021	8,021
5. Net Realized Gain (Loss)	1,410	1,410
6. Other (Includes State Appropriation)	59	59
7. Net Change in Unrealized Gain (Loss)	2,849	0
8. Total Revenue	$28,278	$25,429
C. OPERATING EXPENSES		
1. Service Retirements	$6,272	$6,272
2. Disability Benefits	163	163
3. Survivor Benefits	752	752
4. Refunds	78	78
5. Expenses	158	158
6. Other	44	44
7. Total Disbursements	$7,467	$7,467
D. OTHER CHANGES IN RESERVES	4	4
E. ASSETS AVAILABLE AT END OF PERIOD	$173,744	$164,034

TABLE 3

STATE PATROL RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1989

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	12	8							20
25-29	17	38	23						78
30-34	4	22	81	27					134
35-39	8	6	33	55	21				123
40-44	1	4	14	40	69	27			155
45-49	1		2	9	35	74	9		130
50-54				2	5	37	38	5	87
55-59				1	1	4	12	7	25
60-64				1	1		5	2	9
65+				1			2	1	4
TOTAL	43	78	153	136	132	142	66	15	765

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	24,613	30,970							27,156
25-29	23,620	31,713	34,397						30,741
30-34	23,737	30,717	35,676	38,064					34,987
35-39	24,022	32,596	35,446	38,479	40,703				36,817
40-44	13,551	34,025	36,353	38,697	40,131	38,332			38,777
45-49	36,061		36,917	44,529	39,816	39,037	36,613		39,404
50-54				37,788	42,267	40,789	39,088	41,684	40,113
55-59				22,327	36,290	43,585	40,481	43,330	40,881
60-64				36,881	44,962		36,658	47,303	39,971
65+				41,469			36,092	36,047	37,425
ALL	24,038	31,542	35,512	38,742	40,227	39,488	38,729	42,826	37,009

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
1,034	2,460	5,433	5,269	5,311	5,607	2,556	642	28,312

TABLE 4

STATE PATROL RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1989

AGE	YEARS RETIRED							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59	10	54						64
60-64		43	63					106
65-69	1	4	44	24				73
70-74			14	29	11			54
75-79				2	12	9		23
80-84				1	1	5	11	18
85+					2			2
TOTAL	11	101	121	56	26	14	11	340

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59	22,185	18,951						19,457
60-64		22,816	19,592					20,900
65-69	14,769	21,218	21,586	15,267				19,395
70-74			13,937	17,373	8,538			14,682
75-79				18,791	13,767	7,196		11,633
80-84				12,020	11,355	8,041	6,903	7,751
85+					14,926			14,926
ALL	21,511	20,686	19,663	16,426	11,551	7,498	6,903	17,959

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
237	2,089	2,379	920	300	105	76	6,106

TABLE 5

STATE PATROL RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1989

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	1	1	1					3
50-54								0
55-59		1		3	1			5
60-64				4	1			5
65-69					1			1
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	1	2	1	7	3	0	0	14

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	9,229	16,172	11,251					12,217
50-54								0
55-59		22,431		12,502	8,576			13,703
60-64				15,484	9,133			14,214
65-69					7,983			7,983
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	9,229	19,302	11,251	14,206	8,564	0	0	13,158

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
9	39	11	99	26	0	0	184

TABLE 6

STATE PATROL RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1989

AGE	YEARS SINCE DEATH							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		1		1				2
50-54		1						1
55-59			4	3	2	1		10
60-64		3	6	2	1			12
65-69	1	2	3	5	1			12
70-74		3	4	2	2	1	3	15
75-79		8	3	4		2	3	20
80-84	1	2	5	1	1		4	14
85+			5	2	2	1	5	15
TOTAL	2	20	30	20	9	5	15	101

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		5,933		3,792				4,863
50-54		7,048						7,048
55-59			16,502	6,779	8,782	3,751		10,766
60-64		21,438	15,906	14,923	5,689			16,274
65-69	16,059	16,656	11,309	6,870	8,641			10,524
70-74		5,130	6,615	5,077	8,136	3,904	3,843	5,580
75-79		4,688	7,465	7,499		5,624	3,896	5,642
80-84	3,895	4,706	4,600	3,904	7,817		3,857	4,533
85+			3,777	3,890	3,910	4,896	3,895	3,924
ALL	9,977	8,646	9,537	7,008	7,089	4,760	3,875	7,573

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
20	173	287	140	64	24	58	764.859 766

TABLE 7

STATE PATROL RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1988	740	16	8
B. Additions	46	4	0
C. Deletions:			
1. Service Retirement	(14)	0	
2. Disability	(1)	0	
3. Death	0	0	(1)
4. Terminated-Deferred	(3)		
5. Terminated-Refund	(4)	0	0
6. Terminated-Other Non-vested	0		
7. Returned as Active		(2)	(1)
D. Data Adjustments	1	1	1
Vested	644		
Non-Vested	121		
E. Total on June 30, 1989	765	19	7

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1988	339	13	103
B. Additions	14	1	7
C. Deletions:			
1. Service Retirement		0	
2. Death	(13)	0	(2)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	0	0	(7)
E. Total on June 30, 1989	340	14	101

TABLE 8

STATE PATROL RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1989

A. CURRENT ASSETS (TABLE 1, F6)			$167,271
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			68,356
2. Present Value of Future Normal Costs			69,250
3. Total Expected Future Assets			137,606
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$304,877
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$73,170	$73,170
b. Disability Benefits		2,476	2,476
c. Surviving Spouse and Child Benefits		11,739	11,739
2. Deferred Retirements with Future Augmentation		1,795	1,795
3. Former Members without Vested Rights		59	59
4. Active Members			
a. Retirement Annuities	369	74,040	74,409
b. Disability Benefits	8,139	0	8,139
c. Survivors' Benefits	3,635	0	3,635
d. Deferred Retirements	90	8,631	8,721
e. Refund Liability Due to Death or Withdrawal	0	107	107
5. Total Current Benefit Obligations	$12,233	$172,017	$184,250
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$79,434
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$263,684
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$16,979
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($41,193)

TABLE 9

STATE PATROL RETIREMENT FUND

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1989

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$139,040	$50,253	$88,787
b. Disability Benefits	14,067	7,163	6,904
c. Survivors Benefits	6,232	3,490	2,742
d. Deferred Retirements	14,924	8,052	6,872
e. Refunds Due to Death or Withdrawal	182	292	(110)
f. Total	$174,445	$69,250	$105,195
2. Deferred Retirements with Future Augmentation	$1,795		$1,795
3. Former Members Without Vested Rights	59		59
4. Annuitants in MPRIF Reserve on 6/30/89 is $78,463 without the bounce back subsidy	79,129		79,129
5. Recipients Not in MPRIF	8,256		8,256
6. Total	$263,684	$69,250	$194,434

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$194,434
2. Current Assets (Table 1,F6)	167,271
3. UAAL (B1-B2)	$27,163
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$741,384
2. Supplemental Contribution Rate (B3/C1)	3.66%

TABLE 10

STATE PATROL RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

A. UAAL AT BEGINNING OF YEAR	$26,707
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$5,202
2. Contribution	(7,682)
3. Interest on A, B1, and B2	2,037
4. Total (B1+B2+B3)	($443)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$26,264
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	$1,101
2. Investment Return	(4,530)
3. MPRIF Mortality	287
4. Mortality of Other Benefit Recipients	6
5. Other Items	1,346
6. Total	($1,790)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$24,474
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$6,045
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	($3,356)
H. UAAL AT END OF YEAR (E+F+G)	$27,163

TABLE 11

STATE PATROL RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1989

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352B		
1. Employee Contributions	8.50%	$2,770
2. Employer Contributions	18.90%	6,160
3. Total	27.40%	$8,930
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	12.75%	$4,155
b. Disability Benefits	1.84%	601
c. Survivors	0.93%	304
d. Deferred Retirement Benefits	2.02%	657
e. Refunds Due to Death or Withdrawal	0.07%	23
f. Total	17.61%	$5,740
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $27,163	3.66%	$1,193
3. Allowance for Expenses	0.57%	$186
4. Total	21.84%	$7,119
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	5.56%	$1,811

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1989 is $32,591

TABLE 12

STATE PATROL RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1989					$88,808
1990	$8,930	$749	$652	$7,869	104,206
1991	9,510	8,326	1,293	8,853	112,950
1992	10,129	2,650	1,970	9,835	128,294
1993	10,787	5,591	2,694	11,011	141,807
1994	11,488	7,610	3,448	12,072	154,309
1995	12,235	6,530	4,255	13,178	168,937
1996	13,030	8,231	5,108	14,347	182,975
1997	13,877	12,031	6,019	15,376	194,178
1998	14,779	12,362	6,957	16,312	205,950
1999	15,740	14,447	7,943	17,223	216,523
2000	16,763	11,299	8,976	18,255	231,266
2001	17,852	19,199	10,064	19,173	239,028
2002	19,013	23,405	11,222	19,654	243,068
2003	20,249	23,503	12,437	19,994	247,371
2004	21,565	25,718	13,710	20,267	249,775
2005	22,967	20,960	15,064	20,676	257,394
2006	24,459	23,501	16,527	21,217	263,042
2007	26,049	29,013	18,076	21,464	263,466
2008	27,742	26,712	19,710	21,601	266,387
2009	29,546	18,569	21,444	22,198	278,118
2010	31,466	23,154	23,298	23,003	286,135
2011	33,512	30,717	25,252	23,367	287,045
2012	35,690	32,221	27,332	23,385	286,567
2013	38,010	30,582	29,529	23,419	287,885
2014	40,480	37,518	31,848	23,243	282,242
2015	43,111	35,392	34,330	22,860	278,491
2016	45,914	42,579	36,924	22,244	267,146
2017	48,898	44,885	39,731	21,189	252,617
2018	52,076	37,330	42,692	20,285	244,956
2019	55,461	54,770	45,816	18,903	218,734
2020	56,845	37,595	49,074	17,325	206,235

TABLE 13

STATE PATROL RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: Effective July 1, 1989: 8.5% per annum Prior to July 1, 1989: 8.0% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 6.5% to current fiscal year and 6.5% annually for each future year.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Same as above Female - Same as above
Retirement Age:	Age 58 for State Troopers and for State Police Officers hired after June 30, 1961, or age 63 for State Police Officers hired before July 1, 1961. If over assumed retirement age, one year from the valuation date.
Separation:	Graded rates starting at .03 at age 20 and decreasing to .005 at age 45-49 and .02 for ages 50-54. Adopted 1984.
Disability:	Rates adopted by MSRS as shown in rate table.
Expenses:	Prior year expenses expressed as percentage of prior year payroll. (0.57% of payroll)
Return of Contributions:	All employees withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Family Composition:	100% of members are married. Female is three years younger than male. 15% load on spouse benefits for children's benefits.
Social Security:	NA

Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	Married members assumed to elect subsidized joint and survivor form of annuity as follows: Males - 25% elect 50% J & S option; - 25% elect 100% J & S option; Females - 5% elect 50% J & S option; - 5% elect 100% J & S option.
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method based on earnings and the date the employee entered the plan is applied to all plan benefits. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases 6.5% per annum.
Projected Cash Flow Method:	Cash flows for the non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

SEPARATIONS EXPRESSED AS THE NUMBER OF OCCURRENCES PER 10,000

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
20	5	4	300	300	4	4	0	0
21	5	4	290	290	4	4	0	0
22	5	4	280	280	5	5	0	0
23	6	4	270	270	5	5	0	0
24	6	4	260	260	6	6	0	0
25	6	5	250	250	6	6	0	0
26	7	5	240	240	6	6	0	0
27	7	5	230	230	7	7	0	0
28	7	5	220	220	7	7	0	0
29	8	5	210	210	8	8	0	0
30	8	5	200	200	8	8	0	0
31	9	6	190	190	9	9	0	0
32	9	6	180	180	9	9	0	0
33	10	6	170	170	10	10	0	0
34	10	7	160	160	10	10	0	0
35	11	7	150	150	11	11	0	0
36	12	7	140	140	12	12	0	0
37	13	8	130	130	13	13	0	0
38	14	8	120	120	15	15	0	0
39	15	9	110	110	16	16	0	0
40	16	9	100	100	18	18	0	0
41	18	10	90	90	20	20	0	0
42	20	10	80	80	22	22	0	0
43	23	11	70	70	24	24	0	0
44	26	12	60	60	26	26	0	0
45	29	13	50	50	29	29	0	0
46	33	14	50	50	32	32	0	0
47	38	15	50	50	36	36	0	0
48	42	16	50	50	41	41	0	0
49	47	18	50	50	46	46	0	0
50	53	20	200	200	50	50	0	0
51	59	23	200	200	57	57	0	0
52	65	26	200	200	64	64	0	0
53	71	29	200	200	72	72	0	0
54	78	33	200	200	80	80	0	0

TABLE 13
(cont)

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
55	85	38	0	0	88	88	0	0
56	93	42	0	0	98	98	0	0
57	100	47	0	0	108	108	0	0
58	109	53	0	0	118	118	10,000	10,000
59	119	59	0	0	129	129	0	0
60	131	65	0	0	141	141	0	0
61	144	71	0	0	154	154	0	0
62	159	78	0	0	167	167	0	0
63	174	85	0	0	0	0	0	0
64	192	93	0	0	0	0	0	0
65	213	100	0	0	0	0	0	0
66	236	109	0	0	0	0	0	0
67	263	119	0	0	0	0	0	0
68	292	131	0	0	0	0	0	0
69	324	144	0	0	0	0	0	0
70	361	159	0	0	0	0	0	0

TABLE 14

STATE PATROL RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	State troopers, conservation officers, and certain crime bureau officers.
Contributions	
Member	8.50% of Salary.
Employer	18.90% of Salary.
Allowable Service	Service during which member contributions were deducted. Includes period receiving temporary Workers' Compensation. Allowable Service for benefit purposes stops at age 60 for new members and most of the current members.
Salary	Salaries excluding lump sum payments at separation.
Average Salary	Average of the 5 highest successive years of Salary. Average Salary must be based on all Allowable Service if this service is less than 5 years. (Amended 1989)
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 55 and 3 years of Allowable Service. (Amended 1989)
Amount	2.5% of Average Salary for each year of Allowable Service. (Amended 1989)
Early Retirement Benefit	
Eligibility	Age 50 and 5 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement reduced to the actuarial equivalent of the benefit that would be payable if the Member deferred the benefit until age 55. (Amended 1989)
Form of Payment	Life annuity. Actuarially equivalent options are: 50% or 100% joint and survivor with bounce back feature without additional reduction (option is cancelled if Member is pre-deceased by beneficiary).
Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF). A benefit

	recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Benefit recipients receiving benefits for at least 1 full month but less than 12 full months will receive a partial increase. (Amended 1989)
	Members retired under laws in effect before June 1, 1973 receive an additional 6% supplement. Each year the supplement increases by 6% of the total annuity, which includes both MPRIF and supplemental amounts.
	Members retired under law in effect before June 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is $25 times each full year of Allowable Service or $400 per full year of service less any Social Security benefits received or annuity from a Minnesota public employee pension plan. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from MPRIF. (Amended 1989)
DISABILITY	
Occupational Disability Benefit	
Eligibility	Member under age 55 who cannot perform his duties because of a disability directly resulting from an act of duty.
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 20 years) and Average Salary at disability without reduction for commencement before age 55.
	Payments cease at age 55 or earlier if disability ceases or death occurs. Benefits may be paid upon reemployment but salary plus benefit cannot exceed current salary of position held at time of disability. (Amended 1989)
Non-Duty Disability Benefit	
Eligibility	Under age 55 with at least 1 year of Allowable Service and disability not related to covered employment. (Amended 1989)
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 15 years) and Average Salary at disability without reduction for commencement before age 55. (Amended 1989)

TABLE 14
(cont)

	Payments cease at age 55 or earlier if disability ceases or death occurs. Benefits may be paid upon reemployment but salary plus benefit cannot exceed current salary of position held at time of disability. (Amended 1989)
Form of Payment	Same as for retirement.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Retirement After Disability	
Eligibility	Age 55 with continued disability.
Amount	Optional annuity continues. Otherwise a normal retirement annuity equal to disability benefit paid, or an actuarially equivalent option.
Form of Payment	Same as for retirement.
Benefit Increases	Same as for retirement.
DEATH	
Surviving Spouse Benefit	
Eligibility	Member who is active or receiving a disability benefit.
Amount	50% of Annual Salary if Member was active or occupational disability and either had less than 3 years of Allowable Service or was under age 55. Payment for life or until remarriage. (Amended 1989) Surviving spouse receives the 100% joint and survivor benefit commencing on the Member's 55th birthday if Member was active or a disability with 3 years of Allowable Service. A spouse who had been receiving the 50% benefit shall be entitled to the larger of the two. Payment for life or until remarriage. (Amended 1989)
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Surviving Dependent Children's Benefit	
Eligibility	Member who is active or receiving a disability benefit. Child must be unmarried, under age 18 (or 23 if full time student), and dependent upon the Member. (Amended 1989)

TABLE 14
(cont)

Amount	10% of Average Salary for each child and $20 per month prorated among all dependent children. Benefit must not be less than 50% nor exceed 70% of Average Salary. <u>(Amended 1989)</u>
Refund of Contributions	
Eligibility	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	Member's contributions with 5% interest if death occurred before May 16, 1989, and 6% interest if death occurred on or after May 16, 1989. <u>(Amended 1989)</u>
TERMINATION	
Refund of Contributions	
Eligibility	Termination of state service.
Amount	Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989, and 6% interest compounded annually if termination occurred on or after May 16, 1989. <u>(Amended 1989)</u>
Deferred Benefit	
Eligibility	3 years of Allowable Service. <u>(Amended 1989)</u>
Amount	Benefit computed under law in effect at termination and increased by the following annual percentage: 0% before 7/1/71, 5% from 7/1/71 to 1/1/81, and 3% thereafter until the annuity begins. Amount is payable as a normal or early retirement.

JUDGES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1989

THE Wyatt COMPANY

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

15TH FLOOR
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 22, 1989

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: JUDGES RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1989 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on September 20, 1989.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, FSA
Actuary

JUDGES RETIREMENT FUND

TABLE OF CONTENTS

JUDGES RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/88 VALUATION	07/01/89 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 490 % of Payroll	26.05% *	25.49%
2. Required Contributions - Chapter 356 % of Payroll	28.24%	24.30%
3. Sufficiency (Deficiency) (A1-A2)	-2.19% *	1.19%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$20,760	$23,352
b. Current Benefit Obligations (Table 8)	$59,389	$64,106
c. Funding Ratio (a/b)	34.96%	36.43%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$20,760	$23,352
b. Actuarial Accrued Liability (Table 9)	$59,708	$64,854
c. Funding Ratio (a/b)	34.77%	36.01%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$82,262 *	$98,870
b. Current and Expected Future Benefit Obligations	$88,854	$93,774
c. Funding Ratio (a/b)	92.58% *	105.43%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	246	257
b. Projected Annual Earnings	$17,109	$18,759
c. Average Annual Earnings (Actual $)	$69,548	$72,992
d. Average Age	53.2	53.6
e. Average Service	11.2	11.3
2. Others		
a. Service Retirements (Table 4)	93	95
b. Disability Retirements (Table 5)	5	8
c. Survivors (Table 6)	63	63
d. Deferred Retirements (Table 7)	5	4
e. Terminated Other Non-vested (Table 7)	0	0
f. Total	166	170

* Restated to recognize employer statutory contributions.

JUDGES RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions, representing member contributions and an estimate of employer contributions, for the Judges Retirement Fund are 25.49%. Thus, the statutory contributions exceed the required contribution level of 24.30% by 1.19%. This is the first year that employer contributions have been recognized and the final section of this commentary describes the process.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 36.43%. The corresponding ratio for the prior year was 34.96%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used. For 1989 the ratio is 36.01%, which is an increase from the 1988 value of 34.77%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 105.43% verifies that the current statutory contributions are sufficient. Since the State will make only the necessary payments to fund annuities payable from MPRIF and to pay other benefits as they come due, this Funding Ratio may be considered to be 100% over the lifetime of the Fund.

Asset Information (Tables 1 and 2)

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value of the Assets Available for Benefits and one-third of the difference between the market value and cost value of those assets.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1990 when benefits will be increased for those annuitants who have been receiving payments for at least 7 months. Next year's valuation will include the 1990 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the excess earnings for the January benefit increase as well as the Fund's allocated market share of MPRIF. An approximation of those values on June 30, 1989 is provided below:

MPRIF Reserves	$20,169,000
Reserves Plus Excess Earnings	20,900,000
MPRIF Market Value	22,700,000

The non-MPRIF Reserves amount of $12,395,000 on line D4 of Table 1 represents the liability for benefits that are paid directly by the Fund.

Membership Data (Tables 3, 4, 5, 6 and 7)

Tables 3 through 6 summarize statistical information about members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year except in the case of new hires whose earnings have been annualized.

The service retirements in Table 4 include not only those retiring from active status but also disabled members who have attained retirement age. Disabled members under retirement age are shown in Table 5. The survivors category (Table 6) includes spouses and children of deceased members.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The July 1, 1989 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table. This table shows the impact of the change in actuarial assumptions. See page 9 for an explanation of the change in actuarial assumptions.

	Old Assumptions	New Assumptions
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$33,024,000	$33,014,000
Current Employees -		
Accumulated employee contributions including allocated investment income	5,930,000 *	5,930,000 *
Employer-financed vested	18,969,000	18,076,000
Employer-financed nonvested	7,365,000	7,086,000
Total Pension Benefit Obligation	$65,288,000	$64,106,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) illustrates the two techniques for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- No gain or loss from salaries because the average increase was equal to the expected increase.

- A gain from Current Assets because the return was 16.8% instead of the assumed 8%.

<u>Contribution Sufficiency (Table 11)</u>

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- Normal Costs based on the Entry Age Normal Actuarial Cost Method

- A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability

- An Allowance for Expenses

Table 11 shows the Fund has a contribution sufficiency since the Statutory Contribution Rate is 25.49% compared to the Required Contribution Rate of 24.30%.

<u>Projected Cash Flow (Table 12)</u>

Table 12 illustrates the anticipated cash flow over the amortization period.

The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rate for employees and an estimate of the employer contributions. As members become eligible for payments from MPRIF an amount of reserve is transferred to SBI. The other disbursements represent benefit payments made directly by the Fund.

State contributions are approximated from Table 12 by assuming that the State pays 85% of the amount transferred to MPRIF (the remaining 15% coming from member contributions) and 100% of the other disbursements.

This projected cash flow assumes that future payrolls increase by 6.5%. This is the only table in the report where new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8.5% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year. The amount for 1991 is large because it includes those already over age 68 who are assumed to retire a year from the valuation date.

Changes in Actuarial Assumptions

The pre-retirement interest rate assumption has been increased from 8.0% to 8.5%. Also, the amortization target date has been changed to July 1, 2020.

	Impact Due To Changes In Actuarial Assumptions	
	Interest Rate Change	Amortization Date Change
Actuarial Accrued Liability	($738,000)	$0,000,000
Projected Benefit Obligation for GASB No. 5	(1,182,000)	0,000,000
Normal Cost	(.80%)	.00%
Supplemental Contribution	.36%	(3.99%)
Required Contribution	(.44%)	(3.99%)

Changes in Plan Provisions

This valuation does not reflect any changes in plan provisions since the prior valuation.

Recognition of Employer Contributions

Each year the State pays the amounts required to fund new annuities from MPRIF and to make other benefit payments during the year. Since these contribution amounts can vary considerably from year to year, they have not been included in prior actuarial reports for measuring contribution sufficiency. As a result, large contribution deficiencies have been reported.

This report recognizes employer contributions for the first time and, as a result, a contribution sufficiency is reported. Employer contributions have been estimated based on the projected cash flows in Table 12. The projected transfers to MPRIF are assumed to consist of 85% employer money and 15% member money. Eighty-five percent of the transfers for the next five years are translated to current dollars and averaged to get the employer contributions to MPRIF. One hundred percent of the other disbursements for next year are assumed to represent additional employer contributions needed to make benefit payments and cover expenses.

The argument can be made that there should be no contribution sufficiency or deficiency because the State will pay whatever is required to provide benefits. However, this method of payment is not one of the acceptable actuarial methods and does not provide for advance funding. Therefore, this report continues the tradition of measuring statutory contributions (now increased to acknowledge the employer portion) against an acceptable actuarial calculation (the entry age normal method) as the standard benchmark used by all major funds in the State of Minnesota for purposes of evaluating contribution sufficiency (deficiency).

TABLE 1

JUDGES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1989

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$238	$238
2. Investments		
a. Fixed Income	695	709
b. Equity	2,246	2,204
c. Real Estate	266	214
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	20,169	20,169
4. Other	0	0
B. TOTAL ASSETS	$23,614	$23,534
C. AMOUNTS CURRENTLY PAYABLE	$209	$209
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$4,477	$4,477
2. State Reserves	(13,636)	(13,716)
3. MPRIF Reserves	20,169	20,169
4. Non-MPRIF Reserves	12,395	12,395
5. Total Assets Available for Benefits	$23,405	$23,325
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$23,614	$23,534

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$23,325
2. Market Value (D5)	$23,405	
3. Cost Value (D5)	23,325	
4. Market Over Cost (F2-F3)	$80	
5. 1/3 of Market Over Cost(F4)/3		27
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$23,352

TABLE 2

JUDGES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$20,733	$20,773
B. OPERATING REVENUES		
1. Member Contributions	$733	$733
2. Employer Contributions	2,875	2,875
3. Investment Income	468	468
4. MPRIF Income	1,914	1,914
5. Net Realized Gain (Loss)	61	61
6. Other	44	44
7. Net Change in Unrealized Gain (Loss)	120	0
8. Total Revenue	$6,215	$6,095
C. OPERATING EXPENSES		
1. Service Retirements	$2,451	$2,451
2. Disability Benefits	125	125
3. Survivor Benefits	875	875
4. Refunds	25	25
5. Expenses	51	51
6. Other	16	16
7. Total Disbursements	$3,543	$3,543
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$23,405	$23,325

TABLE 3

JUDGES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1989

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25									0
25-29									0
30-34									0
35-39	4	6	3						13
40-44	1	25	18	4					48
45-49		11	19	8	1				39
50-54	2	8	7	13	11	4	1		46
55-59		6	3	8	7	2			26
60-64	1	3	8	8	13	10	4	5	52
65+		1	5	5	5	7	9	1	33
TOTAL	8	60	63	46	37	23	14	6	257

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25									0
25-29									0
30-34									0
35-39	68,879	72,102	46,732						65,256
40-44	70,110	70,118	71,374	72,447					70,783
45-49		71,418	72,036	67,655	71,677				70,954
50-54	69,533	71,307	70,534	72,151	71,677	71,677	71,677		71,480
55-59		65,694	71,777	71,677	71,677	71,678			70,308
60-64	66,470	72,704	74,787	72,847	71,968	65,905	71,677	63,184	70,441
65+		71,677	75,320	71,677	73,549	72,599	72,020	71,677	72,802
ALL	68,895	70,426	71,073	71,382	72,032	69,448	71,897	64,599	70,796

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
551	4,226	4,477	3,284	2,665	1,597	1,007	388	18,195

TABLE 4

JUDGES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1989

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64	2	2						4
65-69	2	14	2					18
70-74	1	17	10	1	1			30
75-79			11	5				16
80-84			1	13	5			19
85+				3	2	3		8
TOTAL	5	33	24	22	8	3	0	95

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64	26,213	21,408						23,810
65-69	20,662	24,330	19,289					23,363
70-74	41,679	27,545	37,864	19,065	15,502			30,772
75-79			32,456	20,158				28,613
80-84			11,736	23,527	22,958			22,757
85+				27,802	10,372	25,675		22,647
ALL	27,085	25,809	32,749	23,142	18,879	25,675	0	26,424

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
135	852	786	509	151	77	0	2,510

TABLE 5

JUDGES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1989

AGE	YEARS DISABLED							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54		1						1
55-59								0
60-64		1		1				2
65-69			2					2
70-74		2		1				3
75-79								0
80-84								0
85+								0
TOTAL	0	4	2	2	0	0	0	8

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54		17,189						17,189
55-59								0
60-64		32,081		22,737				27,409
65-69			31,312					31,312
70-74		22,106		17,366				20,526
75-79								0
80-84								0
85+								0
TOTAL	0	23,370	31,312	20,052	0	0	0	24,526

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	93	63	40	0	0	0	196

TABLE 6

JUDGES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1989

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	1	3						4
50-54		1						1
55-59	1							1
60-64		2	2	4		1		9
65-69		2	4			1		7
70-74		3	1	1				5
75-79		3	5	5		3	1	17
80-84		3	1			1	2	7
85+		4	2	2		2	2	12
TOTAL	2	21	15	12	0	8	5	63

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	15,711	20,406						19,232
50-54		14,491						14,491
55-59	7,562							7,562
60-64		16,506	13,927	8,828		15,502		12,409
65-69		23,548	19,228			15,502		19,930
70-74		8,547	28,393	10,947				12,996
75-79		14,689	17,652	11,030		7,962	7,267	12,860
80-84		14,692	14,906			15,502	7,024	12,647
85+		13,048	12,870	18,724		15,503	11,264	14,076
ALL	11,637	15,323	17,471	11,571	0	12,675	8,768	14,146

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
23	322	262	139	0	101	44	891

TABLE 7

JUDGES RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1988	246	5	0
B. Additions	14	0	0
C. Deletions:			
1. Service Retirement	(5)	(1)	0
2. Disability	0		
3. Death	(2)	0	0
4. Terminated-Deferred	0		
5. Terminated-Refund	0	0	0
6. Terminated-Other Non-vested	0		
7. Returned as Active		0	0
D. Data Adjustments	4	0	0
Vested	189		
Non-Vested	68		
E. Total on June 30, 1989	257	4	0

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1988	93	5	63
B. Additions	6	0	3
C. Deletions:			
1. Service Retirement		0	
2. Death	(4)	0	(1)
3. Annuity Expired	0		0
4. Returned as Active	0	0	
D. Data Adjustments	0	3	(2)
E. Total on June 30, 1989	95	8	63

TABLE 8

JUDGES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1989

A. CURRENT ASSETS (TABLE 1, F6)			$23,352
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			46,598
2. Present Value of Future Normal Costs			28,920
3. Total Expected Future Assets			75,518
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$98,870
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$21,791	$21,791
b. Disability Benefits		2,121	2,121
c. Surviving Spouse and Child Benefits		8,652	8,652
2. Deferred Retirements		450	450
3. Former Members without Vested Rights		0	0
4. Active Members			
a. Retirement Annuities	1,010	23,865	24,875
b. Disability Benefits	1,793	0	1,793
c. Survivors' Benefits	4,283	0	4,283
d. Deferred Retirements	0	0	0
e. Refund Liability Due to Death or Withdrawal	0	141	141
5. Total Current Benefit Obligations	$7,086	$57,020	$64,106
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$29,668
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$93,774
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$40,754
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($5,096)

JUDGES RETIREMENT FUND

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1989

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$48,825	$20,935	$27,890
b. Disability Benefits	3,638	2,312	1,326
c. Survivors Benefits	7,995	5,503	2,492
d. Deferred Retirements	0	0	0
e. Refunds Due to Death or Withdrawal	302	170	132
f. Total	$60,760	$28,920	$31,840
2. Deferred Retirements	$450		$450
3. Former Members Without Vested Rights	0		0
4. Annuitants in MPRIF	20,169		20,169
5. Recipients Not in MPRIF	12,395		12,395
6. Total	$93,774	$28,920	$64,854

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$64,854
2. Current Assets (Table 1,F6)	23,352
3. UAAL (B1-B2)	$41,502
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$426,725
2. Supplemental Contribution Rate (B3/C1)	9.73%

TABLE 10

JUDGES RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

A. UAAL AT BEGINNING OF YEAR	$38,948
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$2,523
2. Contribution	(3,608)
3. Interest on A, B1, and B2	3,072
4. Total (B1+B2+B3)	$1,987
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$40,935
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	$0
2. Investment Return	(298)
3. MPRIF Mortality	130
4. Mortality of Other Benefit Recipients	292
5. Other Items	1,181
6. Total	$1,305
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$42,240
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	($738)
H. UAAL AT END OF YEAR (E+F+G)	$41,502

TABLE 11

JUDGES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1989

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 490		
1. Employee Contributions	4.30%	$806
2. Employer Contributions	21.19%	3,975
3. Total	25.49%	$4,781
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	10.25%	$1,922
b. Disability Benefits	1.08%	202
c. Survivors	2.86%	537
d. Deferred Retirement Benefits	0.00%	0
e. Refunds Due to Death or Withdrawal	0.07%	14
f. Total	14.26%	$2,675
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $41,502	9.73%	$1,825
3. Allowance for Expenses	0.31%	$58
4. Total	24.30%	$4,558
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	1.19%	$223

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1989 is $18,759

TABLE 12

JUDGES RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1989					$3,183
1990	$4,781	$785	$1,395	$381	6,165
1991	5,271	5,055	1,315	477	5,543
1992	5,153	2,587	1,256	527	7,380
1993	5,847	7,344	1,197	513	5,199
1994	5,218	2,473	1,138	510	7,316
1995	5,686	3,845	1,076	654	8,736
1996	5,815	4,533	1,018	754	9,754
1997	5,884	7,518	957	719	7,882
1998	5,156	3,327	900	709	9,520
1999	5,433	5,349	843	777	9,539
2000	5,932	4,235	790	849	11,294
2001	6,562	4,588	736	1,013	13,546
2002	7,091	2,536	688	1,316	18,729
2003	8,586	4,822	641	1,725	23,577
2004	9,676	9,513	595	1,986	25,131
2005	9,941	8,391	541	2,179	28,320
2006	10,758	7,695	501	2,516	33,398
2007	11,448	12,019	453	2,795	35,169
2008	11,689	10,935	416	3,004	38,511
2009	12,667	10,632	385	3,344	43,505
2010	13,928	13,048	353	3,720	47,751
2011	15,047	10,269	326	4,248	56,452
2012	16,730	12,525	305	4,964	65,316
2013	19,596	16,743	270	5,662	73,560
2014	21,766	17,850	250	6,408	83,634
2015	23,084	19,562	229	7,249	94,176
2016	23,834	19,060	211	8,199	106,938
2017	26,323	30,822	180	8,891	111,150
2018	26,215	29,393	140	9,307	117,139
2019	25,158	22,623	128	10,059	129,605
2020	24,783	19,717	112	11,227	145,787

TABLE 13

JUDGES RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: Effective July 1, 1989: 8.5% per annum Prior to July 1, 1989: 8.0% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 2.5% to current fiscal year and 6.5% annually for each future year.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Same as above Female - Same as above
Retirement Age:	Judges: Age 68, or if over age 68, one year from the valuation date. Supreme Court Justices in Pre-1974 Plan: Latest of Age 70, 12 years of service, or one year from valuation date.
Separation:	None.
Disability:	Rates adopted by MSRS based on actual experience, most recently adjusted in 1979, as shown in rate table.
Expenses:	Prior year expenses expressed as percentage of prior year payroll. (0.31% of payroll)
Return of Contributions:	NA
Family Composition:	Marital status as indicated by data. Female is three years younger than male.
Social Security:	Maximum Current Primary amount ($899/month for 1989), increasing with salary scale. Covered annual wages: $48,000 Contribution rate: 7.51% for 1989, 7.65% for 1990 and later.

TABLE 13
(cont)

Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	NA
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method based on earnings and the date the employee entered the plan is applied to all plan benefits. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases 6.5% per annum.
Projected Cash Flow Method:	Cash flows for the non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

SEPARATIONS EXPRESSED AS THE
NUMBER OF OCCURRENCES PER 10,000

	Death		Withdrawal		Disability		Retirement	
Age	Male	Female	Male	Female	Male	Female	Male	Female
20	5	4	0	0	0	0	0	0
21	5	4	0	0	0	0	0	0
22	5	4	0	0	0	0	0	0
23	6	4	0	0	0	0	0	0
24	6	4	0	0	0	0	0	0
25	6	5	0	0	0	0	0	0
26	7	5	0	0	0	0	0	0
27	7	5	0	0	0	0	0	0
28	7	5	0	0	0	0	0	0
29	8	5	0	0	0	0	0	0
30	8	5	0	0	2	0	0	0
31	9	6	0	0	2	0	0	0
32	9	6	0	0	2	0	0	0
33	10	6	0	0	2	0	0	0
34	10	7	0	0	2	0	0	0
35	11	7	0	0	2	1	0	0
36	12	7	0	0	2	1	0	0
37	13	8	0	0	2	1	0	0
38	14	8	0	0	2	1	0	0
39	15	9	0	0	2	2	0	0
40	16	9	0	0	2	2	0	0
41	18	10	0	0	2	2	0	0
42	20	10	0	0	2	4	0	0
43	23	11	0	0	3	4	0	0
44	26	12	0	0	3	4	0	0
45	29	13	0	0	3	5	0	0
46	33	14	0	0	5	6	0	0
47	38	15	0	0	7	7	0	0
48	42	16	0	0	9	7	0	0
49	47	18	0	0	11	10	0	0
50	53	20	0	0	14	10	0	0
51	59	23	0	0	16	12	0	0
52	65	26	0	0	20	14	0	0
53	71	29	0	0	24	16	0	0
54	78	33	0	0	28	20	0	0

TABLE 13
(cont)

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
55	85	38	0	0	34	24	0	0
56	93	42	0	0	40	30	0	0
57	100	47	0	0	46	36	0	0
58	109	53	0	0	56	44	0	0
59	119	59	0	0	66	52	0	0
60	131	65	0	0	76	62	0	0
61	144	71	0	0	90	74	0	0
62	159	78	0	0	110	88	0	0
63	174	85	0	0	136	104	0	0
64	192	93	0	0	174	122	0	0
65	213	100	0	0	0	0	0	0
66	236	109	0	0	0	0	0	0
67	263	119	0	0	0	0	0	0
68	292	131	0	0	0	0	10,000	10,000
69	324	144	0	0	0	0	0	0
70	361	159	0	0	0	0	0	0

TABLE 14
BASIC

JUDGES RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	A judge or justice of any court who is not covered under the Social Security Act. If the Member was active prior to 1/1/74, benefits may be computed according to provisions of the prior plan.
Contributions	
Member	0.5% of Salary plus the Social Security tax rate. Members who were active prior to 1/1/74 may contribute 4% to a special survivor retirement account.
Employer	Terminal funding basis.
Allowable Service	Service as a judge. Half credit is received for service not compensated at an annual salary or for service while entitled to practice law. Credit may also be earned for uncredited judicial service if the appropriate employee contributions, with interest, are made.
Salary	Salary set by law.
Average Salary	Average of the 5 highest years of Salary of the last 10 years prior to retirement.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 65 and 5 years of Allowable Service. Age 70.
Amount	2.5% of Average Salary for each year of Allowable Service prior to 7/1/80 and 3% of Average Salary for each year of Allowable Service after 6/30/80. Maximum benefit of 65% of salary for the 12 months preceding retirement.
Early Retirement Benefit	
Eligibility	Age 62 and 5 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.5% for each month the Member is under age 65 at time of retirement.

Form of Payment	Life annuity. Actuarially equivalent options are: 50% or 100% joint and survivor 50% or 100% bounce back joint and survivor (option is cancelled if Member is pre-deceased by beneficiary). 10 or 15 year certain and life.
Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF).
DISABILITY	
Disability Benefit	
Eligibility	Permanent inability to perform the functions of judge.
Amount	No benefit is paid by the Fund. Instead salary is continued for 2 years, but not beyond age 70. Employee contributions continue and Allowable Service is earned.
Retirement After Disability	
Eligibility	Member is still disabled after salary payments cease after 2 years, or at age 70, if earlier.
Amount	Larger of 25% of Average Salary or the Normal Retirement Benefit, without reduction.
Benefit Increases	Same as for retirement.
DEATH	
Survivors' Benefit	
Eligibility	Active or disabled Member dies before retirement or a former Member eligible for a deferred annuity dies.
Amount	Larger of 25% of Average Salary or 60% of Normal Retirement Benefit had the Member retired at date of death. Benefit paid to spouse for life. If no spouse, benefit is paid to surviving dependent children until child marries, dies, or attains age 18 (age 22 if full time student).
Benefit Increases	Same as for retirement.

Prior Survivors' Benefit	
Eligibility	Retired Member dies who did not elect an optional annuity and such Member retired prior to 1/1/74 or was in office prior to 1/1/74 and continued contributing 4% of pay to provide this post-retirement death benefit.
Amount	50% of the retired Member's benefit continues to the surviving spouse if married 3 years. Benefit begins immediately unless spouse is not yet age 40 and continues to the earlier of remarriage or death.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Refund of Contributions	
Eligibility	Member dies prior to retirement or former Member eligible for a deferred annuity dies and survivors' benefits are not payable.
Amount	Member's contributions with 5% interest.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of service as a judge.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Benefit	
Eligibility	5 years of Allowable Service.
Amount	Benefit computed under law in effect at termination. Amount is payable as a normal or early retirement annuity.

JUDGES RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	A judge or justice of any court who is covered under the Social Security Act.
Contributions	
Member	1.25% of Salary plus the Social Security tax rate reduced by the Member's Social Security tax.
Employer	Terminal funding basis.
Allowable Service	Service as a judge. Half credit is received for service not compensated at an annual salary or for service while entitled to practice law. Credit may also be earned for uncredited judicial service if the appropriate employee contributions, with interest, are made.
Salary	Salary set by law.
Average Salary	Average of the 5 highest years of Salary of the last 10 years prior to retirement.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 65 and 5 years of Allowable Service. Age 70.
Amount	2.5% of Average Salary for each year of Allowable Service prior to 7/1/80 and 3% of Average Salary for each year of Allowable Service after 6/30/80 reduced by 50% of the member's primary Social Security. Maximum benefit of 65% of salary for the 12 months preceding retirement.
Early Retirement Benefit	
Eligibility	Age 62 and 5 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.5% for each month the Member is under age 65 at time of retirement.
Form of Payment	Life annuity. Actuarially equivalent options are: 50% or 100% joint and survivor 50% or 100% bounce back joint and survivor (option is cancelled if Member is pre-deceased by beneficiary). 10 or 15 year certain and life.

Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF).
DISABILITY	
Disability Benefit	
Eligibility	Permanent inability to perform the functions of judge.
Amount	No benefit is paid by the Fund. Instead salary is continued for 2 years, but not beyond age 70. Employee contributions continue and Allowable Service is earned.
Retirement After Disability	
Eligibility	Member is still disabled after salary payments cease after 2 years, or at age 70, if earlier.
Amount	Larger of 25% of Average Salary reduced by 50% of the Member's primary Social Security or the Normal Retirement Benefit, without reduction for age.
Benefit Increases	Same as for retirement.
DEATH	
Survivors' Benefit	
Eligibility	Active or disabled Member dies before retirement or a former Member eligible for a deferred annuity dies.
Amount	Larger of 25% of Average Salary or 60% of Normal Retirement Benefit had the Member retired at date of death. The primary Social Security is the amount upon which Social Security survivors' benefits are based. Benefit paid to spouse for life. If no spouse, benefit is paid to surviving dependent children until child marries, dies, or attains age 18 (age 22 if full time student).
Benefit Increases	Same as for retirement.
Refund of Contributions	
Eligibility	Member dies prior to retirement or former Member eligible for a deferred annuity dies and survivors' benefits are not payable.

Amount	Member's contributions with 5% interest.

TERMINATION

Refund of Contributions	
Eligibility	Termination of service as a judge.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Benefit	
Eligibility	5 years of Allowable Service.
Amount	Benefit computed under law in effect at termination. Amount is payable as a normal or early retirement annuity.

LEGISLATORS RETIREMENT PLAN

ACTUARIAL VALUATION REPORT

JULY 1, 1989

THE Wyatt COMPANY

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

15TH FLOOR
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 27, 1989

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: LEGISLATORS RETIREMENT PLAN

Commission Members:

We have prepared an actuarial valuation of the Plan as of July 1, 1989 based on membership and financial data supplied by the Plan.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on September 20, 1989.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, FSA
Actuary

LEGISLATORS RETIREMENT PLAN

TABLE OF CONTENTS

LEGISLATORS RETIREMENT PLAN

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/88 VALUATION	07/01/89 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 3A % of Payroll	25.06% *	26.34%
2. Required Contributions - Chapter 356 % of Payroll	33.58%	31.52%
3. Sufficiency (Deficiency) (A1-A2)	-8.52% *	-5.18%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$11,857	$12,317
b. Current Benefit Obligations (Table 8)	$23,758	$26,998
c. Funding Ratio (a/b)	49.91%	45.62%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$11,857	$12,317
b. Actuarial Accrued Liability (Table 9)	$24,882	$28,821
c. Funding Ratio (a/b)	47.65%	42.74%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$25,730 *	$32,712
b. Current and Expected Future Benefit Obligations	$33,120	$39,361
c. Funding Ratio (a/b)	77.69% *	83.11%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	201	201
b. Projected Annual Earnings	$4,932	$6,114
c. Average Annual Earnings (Actual $)	$24,540	$30,416
d. Average Age	47.8	48.4
e. Average Service	7.3	7.7
2. Others		
a. Service Retirements (Table 4)	125	125
b. Disability Retirements (Table 5)	NA	NA
c. Survivors (Table 6)	44	36
d. Deferred Retirements (Table 7)	97	95
e. Terminated Other Non-vested (Table 7)	17	16
f. Total	283	272

* Restated to recognize employer statutory contribution.

LEGISLATORS RETIREMENT PLAN

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Plan. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions, representing member contributions and an estimate of employer contributions, for the Legislators Retirement Plan are 26.34%. The remaining 5.18% needed to reach the required contribution level of 31.52% will be paid by the State as needed in future years according to Chapter 3A of Minnesota Statutes. This is the first year that employer contributions have been recognized and the final section of this commentary describes the process.

The financial status of the Plan can be measured by three different funding ratios:

- o The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 45.62%. The corresponding ratio for the prior year was 49.91%.

- o The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used by the State. For 1989 the ratio is 42.74% which is a decrease from the 1988 value of 47.65%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 83.11% verifies that the current statutory contributions, including the estimated employer contributions, are going to cover only a portion of the plan benefits. Since the State will make the necessary contributions to fund annuities payable from MPRIF and to pay other benefits as they come due, this Funding Ratio may be considered to be 100% over the lifetime of the Plan.

__Asset Information (Tables 1 and 2)__

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value of the Assets Available for Benefits and one-third of the difference between the market value and cost value of those assets.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

This Plan participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1990 when benefits will be increased for those annuitants who have been receiving payments for at least 7 months. Next year's valuation will include the 1990 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the excess earnings for the January benefit increase as well as the Fund's allocated market share of MPRIF. An approximation of those values on June 30, 1989 is provided below:

MPRIF Reserves	$8,767,000
Reserves Plus Excess Earnings	9,100,000
MPRIF Market Value	9,880,000

Membership Data (Tables 3, 4, 6 and 7)

Tables 3 through 6 summarize statistical information about members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year and do not include any per diem payments.

The service retirements in Table 4 include not only those retiring from active status but also members with deferred benefits who have attained retirement age and started receiving benefits.

The survivors category (Table 6) includes spouses and children of deceased members.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

<u>Actuarial Balance Sheet (Table 8)</u>

An actuarial balance sheet provides a method for evaluating current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The July 1, 1989 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table. This table shows the impact of the changes in plan provisions on the liabilities under the old actuarial assumptions. See page 10 for an explanation of the changes in plan provisions.

	Old Benefits	New Benefits
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$16,933,000	$16,933,000
Current Employees -		
Accumulated employee contributions including allocated investment income	3,264,000 *	3,264,000 *
Employer-financed vested	3,356,000	5,367,000
Employer-financed nonvested	1,883,000	2,065,000
Total Pension Benefit Obligation	$25,436,000	$27,629,000

* Estimated

The table on the following page shows the impact of the change in actuarial assumptions using the new plan provisions. See page 11 for an explanation of the changes in actuarial assumptions.

	Old Assumptions	New Assumptions
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$16,933,000	$16,762,000
Current Employees -		
Accumulated employee contributions including allocated investment income	3,264,000 *	3,264,000 *
Employer-financed vested	5,367,000	4,823,000
Employer-financed nonvested	2,065,000	2,149,000
Total Pension Benefit Obligation	$27,629,000	$26,998,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) illustrates the two techniques for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal

Actuarial Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- No gain or loss from salaries because the average increase was equal to the expected increase.

- A loss from Non-MPRIF Current Assets because no interest or investment return is credited.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required

Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- o Normal Costs based on the Entry Age Normal Actuarial Cost Method
- o A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability
- o An Allowance for Expenses

Table 11 shows the Plan has a contribution deficiency since the Statutory Contribution Rate is 26.34% compared to the Required Contribution Rate of 31.52%. As noted earlier, the State will make the necessary contributions to fund annuities payable from MPRIF and to pay other benefits as they come due.

Projected Cash Flow (Table 12)

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rate for employees and an estimate of the employer contributions. As members become eligible for payments from MPRIF an amount of reserve is transferred to SBI. The other disbursements represent benefit payments made directly by the Plan.

State contributions are approximated from Table 12 by assuming that the State pays 85% of the amount transferred to MPRIF (the remaining 15% coming from member contributions) and 50% of the other disbursements (the remaining 50% coming from member contributions primarily in the form of refunds).

This projected cash flow assumes that future payrolls excluding the per diem payments increase by 6.5%. The per diem payments are assumed to remain constant each year in the future. This is the only table in the report where new members are assumed to be hired in order to replace those who terminate from the active group. The interest return is $0 because member contributions are retained in the State general fund and amounts contributed by the State are transferred to MPRIF or paid out in the form of benefits.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year.

Changes in Plan Provisions

There were changes in benefits in 1989 that are recognized in the July 1, 1989 actuarial valuation. These changes in benefits are summarized below:

- Per diem payments paid to a member during a regular or special session are included in salary for benefit computation purposes.

- The retirement benefit was changed to include years of service beyond 20 and member contibutions are made for all years of service.

- The early retirement reduction factor was changed from 6% per year to an actuarial equivalent reduction with 3% augmentation.

- The deferred annuity is now augmented at 5% a year for each year that the benefit is deferred beyond age 55.

	Impact Due To Changes In Plan Provisions
Actuarial Accrued Liability	$2,731,000
Pension Benefit Obligation for GASB No. 5	2,193,000
Normal Cost	.95%
Supplemental Contribution	(.67%)
Required Contribution	.28%

The required contribution increased from 34.35% to 41.04% based on the old definition of covered salary. However, the benefit improvement includes the addition of per diem payments to covered salary. The increase in the covered salary changes the percentages to 29.99% for old benefits and 34.63% for new benefits. The above increase of .28% represents the difference from 34.35% to 34.63%.

Changes in Actuarial Assumptions

The pre-retirement interest rate assumption has been increased from 8.0% to 8.5%. Also, the amortization target date has been changed to July 1, 2020.

	Impact Due To Changes In Actuarial Assumptions	
	Interest Rate Change	Amortization Date Change
Actuarial Accrued Liability	($530,000)	$ 0
Pension Benefit Obligation for GASB No. 5	(631,000)	0
Normal Cost	(1.03%)	.00%
Supplemental Contribution	.22%	(3.07%)
Required Contribution	(.81%)	(3.07%)

Recognition of Employer Contributions

Each year the State pays the amounts required to fund new annuities from MPRIF and to make other benefit payments during the year. Since these contribution amounts can vary considerably from year to year, they have not been included in prior actuarial reports for measuring contribution sufficiency. As a result, large contribution deficiencies have been reported.

This report recognizes employer contributions for the first time and, as a result, the contribution deficiency is considerably lower. Employer contributions have been estimated based on the projected cash flows found in Table 12. The projected transfers to MPRIF are assumed to consist of 85% employer money and 15% member money. Eighty-five percent of the transfers for the next five years are translated to current dollars and averaged to get the employer contributions to MPRIF. Fifty percent of the other disbursements for next year are assumed to represent additional employer contributions needed to make benefit payments, cover expenses and pay interest upon the refund of member contributions.

The argument can be made that there should be no contribution sufficiency or deficiency because the State will pay whatever is required to provide benefits. However, this method of payment is not one of the acceptable actuarial methods and does not provide for advance funding. Therefore, this report continues the tradition of measuring statutory contributions (now increased to acknowledge the employer portion) against an acceptable actuarial calculation (the entry age normal cost method) as the standard benchmark used by all major funds in the State of Minnesota for purposes of evaluating contribution sufficiency (deficiency).

TABLE 1

LEGISLATORS RETIREMENT PLAN

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1989

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$0	$0
2. Investments		
a. Fixed Income	0	0
b. Equity	0	0
c. Real Estate	0	0
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	8,767	8,767
4. Other	3,658	3,658
B. TOTAL ASSETS	$12,425	$12,425
C. AMOUNTS CURRENTLY PAYABLE	$108	$108
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$3,622	$3,622
2. State Reserves	(3,715)	(3,715)
3. MPRIF Reserves	8,767	8,767
4. Non-MPRIF Reserves	3,643	3,643
5. Total Assets Available for Benefits	$12,317	$12,317
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$12,425	$12,425

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		$12,317
2. Market Value (D5)	$12,317	
3. Cost Value (D5)	12,317	
4. Market Over Cost (F2-F3)	$0	
5. 1/3 of Market Over Cost(F4)/3		0
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$12,317

TABLE 2

LEGISLATORS RETIREMENT PLAN

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$11,857	$11,857
B. OPERATING REVENUES		
1. Member Contributions	$431	$431
2. Employer Contributions	860	860
3. Investment Income	0	0
4. MPRIF Income	980	980
5. Net Realized Gain (Loss)	0	0
6. Other	0	0
7. Net Change in Unrealized Gain (Loss)	0	0
8. Total Revenue	$2,271	$2,271
C. OPERATING EXPENSES		
1. Service Retirements	$1,056	$1,056
2. Disability Benefits	0	0
3. Survivor Benefits	155	155
4. Refunds	67	67
5. Expenses	36	36
6. Other	1	1
7. Total Disbursements	$1,315	$1,315
D. OTHER CHANGES IN RESERVES	(496)	(496)
E. ASSETS AVAILABLE AT END OF PERIOD	$12,317	$12,317

TABLE 3

LEGISLATORS RETIREMENT PLAN

ACTIVE MEMBERS AS OF JUNE 30, 1989

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25		1							1
25-29		2	1						3
30-34	3	5	4						12
35-39	7	8	12	1					28
40-44	3	12	14	4	4				37
45-49		9	10	7	6				32
50-54	4	4	13	6	5				32
55-59	1	5	9	7	7				29
60-64		4	6	4	5				19
65+		2	3	1	1		1		8
TOTAL	18	52	72	30	28	0	1	0	201

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25		25,138							25,138
25-29		25,138	25,138						25,138
30-34	25,138	25,138	25,138						25,138
35-39	25,138	25,138	25,138	25,138					25,138
40-44	25,138	25,138	25,138	25,138	25,138				25,138
45-49		25,138	25,138	25,138	25,138				25,138
50-54	25,138	25,138	25,138	25,138	25,138				25,138
55-59	25,138	25,138	25,138	25,138	25,138				25,138
60-64		25,138	25,138	25,138	25,138				25,138
65+		25,138	25,138	25,138	25,138		25,138		25,138
ALL	25,138	25,138	25,138	25,138	25,138	0	25,138	0	25,138

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
452	1,307	1,811	754	704	0	25	0	5,053

TABLE 4

LEGISLATORS RETIREMENT PLAN

SERVICE RETIREMENTS AS OF JUNE 30, 1989

	YEARS RETIRED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64	4	22	1					27
65-69		8	31					39
70-74		2	12	12				26
75-79			1	11	5			17
80-84			1	1	5	1		8
85+					5	3		8
TOTAL	4	32	46	24	15	4	0	125

AVERAGE ANNUAL ANNUITY

	YEARS RETIRED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64	5,329	6,759	11,077					6,707
65-69		8,786	8,844					8,832
70-74		13,862	14,158	7,657				11,135
75-79			14,494	7,785	6,284			7,738
80-84			14,885	17,091	8,246	4,289		9,687
85+					8,985	4,840		7,431
ALL	5,329	7,710	10,533	8,109	7,839	4,703	0	8,668

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
21	247	484	195	118	19	0	1,084

TABLE 6

LEGISLATORS RETIREMENT PLAN

SURVIVORS AS OF JUNE 30, 1989

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		1	1	1				3
50-54								0
55-59		1				1		2
60-64		3						3
65-69		3	2	1				6
70-74		5		2				7
75-79	1	3	2	2				8
80-84	1	3	2		1			7
85+								0
TOTAL	2	19	7	6	1	1	0	36

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		17,375	0	5,380				7,585
50-54								0
55-59		2,347				2,232		2,290
60-64		3,685						3,685
65-69		2,837	1,789	4,069				2,693
70-74		5,745		3,161				5,007
75-79	2,171	2,791	6,104	5,403				4,195
80-84	2,348	2,860	3,480		2,725			2,945
85+								0
ALL	2,260	4,472	3,249	4,430	2,725	2,232	0	3,994

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
5	84	23	27	3	2	0	144

TABLE 7

LEGISLATORS RETIREMENT PLAN

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1988	201	97	17
B. Additions	18	8	3
C. Deletions:			
1. Service Retirement	(1)	(4)	
2. Disability	0		
3. Death	(2)	0	0
4. Terminated-Deferred	(8)		
5. Terminated-Refund	(3)	(2)	(3)
6. Terminated-Other Non-vested	(3)		
7. Returned as Active		(5)	(1)
D. Data Adjustments	(1)	1	0
Vested	99		
Non-Vested	102		
E. Total on June 30, 1989	201	95	16

	RECIPIENTS RETIREMENT ANNUITANTS	DISABLED	SURVIVORS
A. On June 30, 1988	125	NA	44
B. Additions	5		3
C. Deletions:			
1. Service Retirement			
2. Death	(5)		(3)
3. Annuity Expired	0		0
4. Returned as Active	0		
D. Data Adjustments	0		(8)
E. Total on June 30, 1989	125	NA	36

TABLE 8

LEGISLATORS RETIREMENT PLAN

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1989

	Non-Vested	Vested	Total
A. CURRENT ASSETS (TABLE 1, F6)			$12,317
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			9,855
2. Present Value of Future Normal Costs			$10,540
3. Total Expected Future Assets			20,395
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$32,712
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$10,808	$10,808
b. Disability Benefits		0	0
c. Surviving Spouse and Child Benefits		1,602	1,602
2. Deferred Retirements with Future Augmentation		4,274	4,274
3. Former Members without Vested Rights		78	78
4. Active Members			
a. Retirement Annuities	1,634	7,931	9,565
b. Disability Benefits	0	0	0
c. Survivors' Benefits	471	0	471
d. Deferred Retirements	44	4	48
e. Refund Liability Due to Death or Withdrawal	0	152	152
5. Total Current Benefit Obligations	$2,149	$24,849	$26,998
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$12,363
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$39,361
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$14,681
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			$6,649

TABLE 9

LEGISLATORS RETIREMENT PLAN

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1989

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$21,217	$9,440	$11,777
b. Disability Benefits	0	0	0
c. Survivors Benefits	1,002	562	440
d. Deferred Retirements	82	77	5
e. Refunds Due to Death or Withdrawal	298	461	(163)
f. Total	$22,599	$10,540	$12,059
2. Deferred Retirements with Future Augmentation	$4,274		$4,274
3. Former Members Without Vested Rights	78		78
4. Annuitants in MPRIF	8,767		8,767
5. Recipients Not in MPRIF	3,643		3,643
6. Total	$39,361	$10,540	$28,821

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$28,821
2. Current Assets (Table 1,F6)	12,317
3. UAAL (B1-B2)	$16,504
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$128,323
2. Supplemental Contribution Rate (B3/C1)	12.86%

TABLE 10

LEGISLATORS RETIREMENT PLAN

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

A. UAAL AT BEGINNING OF YEAR	$13,025
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$894
2. Contribution	(1,291)
3. Interest on A, B1, and B2	1,026
4. Total (B1+B2+B3)	$629
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$13,654
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	$0
2. Investment Return	297
3. MPRIF Mortality	72
4. Mortality of Other Benefit Recipients	56
5. Other Items	224
6. Total	$649
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D7)	$14,303
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$2,731
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	($530)
H. UAAL AT END OF YEAR (E+F+G)	$16,504

TABLE 11

LEGISLATORS RETIREMENT PLAN

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1989

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 3A		
1. Employee Contributions	9.00%	$550
2. Employer Contributions	17.34%	1,060
3. Total	26.34%	$1,610
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	16.04%	$981
b. Disability Benefits	0.00%	0
c. Survivors	0.80%	49
d. Deferred Retirement Benefits	0.20%	12
e. Refunds Due to Death or Withdrawal	0.87%	53
f. Total	17.91%	$1,095
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $16,504	12.86%	$786
3. Allowance for Expenses	0.75%	$46
4. Total	31.52%	$1,927
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-5.18%	($317)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1989 is $5,179 in salaries and $935 in per diem payments.

TABLE 12

LEGISLATORS RETIREMENT PLAN

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1989					$3,550
1990	$1,610	$100	$179	$0	4,881
1991	1,963	2,760	307	0	3,777
1992	1,659	1,159	231	0	4,047
1993	1,812	996	312	0	4,551
1994	1,902	1,806	289	0	4,358
1995	1,966	1,577	347	0	4,400
1996	2,111	874	340	0	5,297
1997	2,453	1,737	380	0	5,633
1998	2,584	1,318	377	0	6,523
1999	2,735	1,945	409	0	6,903
2000	2,918	2,500	413	0	6,909
2001	3,230	2,772	440	0	6,927
2002	3,447	2,291	451	0	7,633
2003	3,912	1,604	473	0	9,468
2004	4,770	2,847	483	0	10,908
2005	5,130	4,514	503	0	11,021
2006	4,950	4,012	508	0	11,451
2007	5,228	5,136	527	0	11,015
2008	5,756	7,045	528	0	9,199
2009	5,392	4,240	552	0	9,798
2010	6,161	2,175	553	0	13,231
2011	6,740	5,229	574	0	14,169
2012	7,392	8,870	571	0	12,119
2013	7,383	4,015	594	0	14,893
2014	7,942	9,399	575	0	12,861
2015	7,578	4,166	615	0	15,658
2016	8,122	9,053	579	0	14,148
2017	8,133	8,611	654	0	13,016
2018	7,931	6,142	593	0	14,213
2019	8,351	6,105	678	0	15,781
2020	8,774	6,225	630	0	17,700

LEGISLATORS RETIREMENT PLAN

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: Effective July 1, 1989: 8.5% per annum Prior to July 1, 1989: 8.0% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date excluding per diem payments increased 2.5% to current fiscal year and 6.5% annually for each future year. Per diem payments were assumed to remain constant each year in the future.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - NA Female - NA
Retirement Age:	Age 62, or if over age 62, one year from the valuation date.
Separation:	Rates based on years of service:

Year	House	Senate
1	0%	0%
2	30	0
3	0	0
4	20	25
5	0	0
6	10	0
7	0	0
8	5	10

Disability:	None
Expenses:	Prior year expenses expressed as percentage of prior year payroll. (0.75% of payroll)

TABLE 13
(cont)

Return of Contributions:	All employees withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Family Composition:	85% of Members are married. Female is three years younger than male. Each Member may have up to two dependent children depending on Member's age.
Social Security:	NA
Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	Per diem payments for regular and special sessions were included in salary. The annual amount of per diem that is recognized in this valuation is $4,650 per member. This is based on $48 per day times an average session of 95 days.
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method based on earnings and the date the employee entered the plan is applied to all plan benefits. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases 6.5% per annum.
Projected Cash Flow Method:	Cash flows for the non-MPRIF portion of the Plan were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition new entrants were assumed so that the total payroll excluding the per diem payments would increase by 6.5% per annum. The per diem payments were assumed to remain constant each year in the future.

TABLE 14

LEGISLATORS RETIREMENT PLAN

SUMMARY OF PLAN PROVISIONS

Eligibility	Members of the State Legislature. A Member of PERA who is elected to the Legislature may elect to remain a Member of PERA and receive credit under PERA for service as a legislator.
Contributions	
Member	9% of Salary. (Amended 1989)
Employer	No statutory contributions.
Service	Granted for the full term unless termination occurs before the end of the term. Service during all or part of 4 regular legislative sessions is deemed to be 8 years of Service. (Amended 1989)
Salary	Compensation received for service as a Member of the legislature. Salary includes the monthly compensation paid to a legislator and the per diem payments paid during a regular or special session. Salary does not include additional compensation attributable to a leadership position. (Amended 1989)
Average Salary	Average of the 5 highest successive years of Salary.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 62 and either 6 full years of Service or Service during all or part of 4 regular legislative sessions. For eligibility purposes, Service does not include credit for time not served when a Member does not serve a full term of office.
Amount	A percentage of Average Salary for each year of service as follows: Prior to 1/1/79 - 5% for the first 8 years - 2.5% for subsequent years After 12/31/78 - 2.5%
Early Retirement Benefit	
Eligibility	Age 60 and either 6 full years of Service or Service during all or part of 4 regular legislative sessions.
Amount	Normal Retirement Benefit based on Service and Average Salary at retirement date assuming augmentation to age 62 at 3% per year and actuarial reduction for each month the Member is under age 62. (Amended 1989)
Form of Payment	Paid as a joint and survivor annuity to Member, spouse, and dependent children.

TABLE 14
(cont)

Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF).
DISABILITY	None.
DEATH BENEFITS	
Surviving Spouse Benefit	
Eligibility	Death while active, or after termination if Service requirements for a Normal Retirement Benefit are met but payments have not begun.
Amount	Survivor's payment of 50% of the retirement benefit of the Member assuming the Member had attained normal retirement age and had a minimum of 8 years of Service. Benefit is paid for life or until remarriage. A former Member's benefit is augmented as a Deferred Annuity to date of death before determining the portion payable to the spouse.
Surviving Dependent Children's Benefit	
Eligibility	Same as spouse's benefit.
Amount	Benefit for first child is 25% of the retirement benefit (computed as for surviving spouse) with 12.5% for each additional child. Maximum payable (including spouse) is 100% of the retirement benefit. Benefits cease when a child marries or attains age 18 (22 if a full time student).
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Refund of Contributions	
Eligibility	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	Member's contributions without interest.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of Service.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Annuity	
Eligibility	Same Service requirement as for Normal Retirement.

TABLE 14
(cont)

Amount	Benefit computed under law in effect at termination and increased by the following annual percentage: 0% before 7/1/73, 5% from 7/1/73 to 1/1/81, and 3% thereafter until January 1 of the year of attainment of age 55 and 5% thereafter until the annuity begins. Amount is payable as a normal or early retirement. (Amended 1989)

ELECTIVE STATE OFFICERS RETIREMENT PLAN

ACTUARIAL VALUATION REPORT

JULY 1, 1989

THE *Wyatt* COMPANY

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

15TH FLOOR
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 22, 1989

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: ELECTIVE STATE OFFICERS RETIREMENT PLAN

Commission Members:

We have prepared an actuarial valuation of the Plan as of July 1, 1989 based on membership and financial data supplied by the Plan.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on September 20, 1989.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, FSA
Actuary

ELECTIVE STATE OFFICERS RETIREMENT PLAN

TABLE OF CONTENTS

ELECTIVE STATE OFFICERS RETIREMENT PLAN

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/88 VALUATION	07/01/89 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352C % of Payroll	34.91% *	35.35%
2. Required Contributions - Chapter 356 % of Payroll	39.43%	33.75%
3. Sufficiency (Deficiency) (A1-A2)	-4.52% *	1.60%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$281	$315
b. Current Benefit Obligations (Table 8)	$1,757	$1,938
c. Funding Ratio (a/b)	15.99%	16.25%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$281	$315
b. Actuarial Accrued Liability (Table 9)	$1,929	$2,101
c. Funding Ratio (a/b)	14.57%	14.99%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$2,004 *	$2,577
b. Current and Expected Future Benefit Obligations	$2,311	$2,430
c. Funding Ratio (a/b)	86.72% *	106.05%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	6	6
b. Projected Annual Earnings	$386	$406
c. Average Annual Earnings (Actual $)	$64,399	$67,618
d. Average Age	50.1	51.1
e. Average Service	8.2	9.2
2. Others		
a. Service Retirements (Table 4)	3	3
b. Disability Retirements (Table 5)	NA	NA
c. Survivors (Table 6)	5	5
d. Deferred Retirements (Table 7)	5	6
e. Terminated Other Non-vested (Table 7)	1	0
f. Total	14	14

* Restated to recognize employer statutory contributions.

ELECTIVE STATE OFFICERS RETIREMENT PLAN

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Plan. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions, representing member contributions and an estimate of employer contributions, for the Elective State Officers Retirement Plan are 35.35%. Thus, the statutory contributions exceed the required contribution level of 33.75% by 1.60%. This is the first year that employer contributions have been recognized and the final section of this commentary describes the process.

The financial status of the Plan can be measured by three different funding ratios.

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 16.25%. The corresponding ratio for the prior year was 15.99%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used by the State. For 1989 the ratio is 14.99%, which is an increase from the 1988 value of 14.57%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 106.05% verifies that the current statutory contributions are sufficient. Since the State will make only the necessary contributions to pay benefits as they come due, this Funding Ratio may be considered to be 100% over the lifetime of the Plan.

Asset Information (Tables 1 and 2)

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value of the Assets Available for Benefits and one-third of the difference between the market value and cost value of those assets.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

The term MPRIF appears on some of the tables with a corresponding value of zero. MPRIF stands for Minnesota Post Retirement Investment Fund, which is used by many of the public funds. For purposes of consistency all of the actuarial reports follow the same format.

Membership Data (Tables 3, 4, 6 and 7)

Tables 3 through 6 summarize statistical information about members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year.

The service retirements in Table 4 include not only those retiring from active status but also members with deferred benefits who have attained retirement age and started receiving benefits. The survivors category (Table 6) includes spouses and children of deceased members.

The reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The July 1, 1989 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the table on the following page. This table shows the impact of the changes in actuarial assumptions. See page 9 for an explanation of the changes in actuarial assumptions.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	Old Assumptions	New Assumptions
	$1,073,000	$1,067,000
Current Employees -		
Accumulated employee contributions including allocated investment income	291,000	291,000 *
Employer-financed vested	486,000	472,000
Employer-financed nonvested	115,000	108,000
Total Pension Benefit Obligation	$1,965,000	$1,938,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) illustrates the two techniques for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- No gain or loss from salaries because the average increase was equal to the expected increase.

- A loss from Current Assets because no interest or investment return is credited.

- A loss of $35,000 (reported on line D5) due to a data change in a terminated participant's record.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory

Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- o Normal Costs based on the Entry Age Normal Actuarial Cost Method
- o A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability
- o An Allowance for Expenses

Table 11 shows the Plan has a contribution sufficiency since the Statutory Contribution Rate is 35.35% compared to the Required Contribution Rate of 33.75%.

Projected Cash Flow (Table 12)

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Current Assets. Contributions are then added based on the present statutory rate for employees and our estimate of the employer contributions. As members become eligible for payments, disbursements are made from the Plan.

This projected cash flow assumes that future payrolls increase by 6.5%. This is the only table in the report where new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The interest return is

$0 because member contributions are retained in the State general fund and amounts contributed by the State are paid out in the form of benefits.

Changes in Actuarial Assumptions

The pre-retirement interest rate assumption has been increased from 8.0% to 8.5%. Also, the amortization target date has been changed to July 1, 2020.

	Impact Due To Changes In Actuarial Assumptions	
	Interest Rate Change	Amortization Date Change
Actuarial Accrued Liability	($29,000)	$0
Pension Benefit Obligation for GASB No. 5	(27,000)	0
Normal Cost	(.74%)	0.00%
Supplemental Contribution	.78%	(7.95%)
Required Contribution	.04%	(7.95%)

Changes in Plan Provisions

This valuation does not reflect any changes in plan provisions since the prior valuation.

Recognition of Employer Contributions

Each year the State pays the amounts required to make benefit payments during the year. (No benefits are paid from MPRIF.) Since these contribution amounts can vary considerably from year to year, they have not been included in prior actuarial reports for measuring contribution sufficiency. As a result, large contribution deficiencies have been reported.

This report recognizes employer contributions for the first time and, as a result, a contribution sufficiency is reported. Employer contributions have been estimated based on the projected cash flows found in Table 12. One hundred percent of the other disbursements for next year are assumed to represent employer contributions needed to make benefit payments and cover expenses. No refunds are assumed for fiscal year 1990.

The argument can be made that there should be no contribution sufficiency or deficiency because the State will pay whatever is required to provide benefits. However, the pay-as-you-go method of payment is not one of the acceptable actuarial methods and does not provide for advance funding. Therefore, this report continues the tradition of measuring statutory contributions (now increased to acknowledge the employer portion) against an acceptable actuarial calculation (the entry age normal method) as the standard benchmark used by all major funds in the State of Minnesota for purposes of evaluating contribution sufficiency (deficiency).

TABLE 1

ELECTIVE STATE OFFICERS RETIREMENT PLAN

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1989

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$0	$0
2. Investments		
a. Fixed Income	0	0
b. Equity	0	0
c. Real Estate	0	0
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	0	0
4. Other	316	316
B. TOTAL ASSETS	$316	$316
C. AMOUNTS CURRENTLY PAYABLE	$1	$1
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$313	$313
2. State Reserves	(708)	(708)
3. MPRIF Reserves	0	0
4. Non-MPRIF Reserves	710	710
5. Total Assets Available for Benefits	$315	$315
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$316	$316

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		$315
2. Market Value (D5)	$315	
3. Cost Value (D5)	315	
4. Market Over Cost (F2-F3)	$0	
5. 1/3 of Market Over Cost(F4)/3		0
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$315

TABLE 2

ELECTIVE STATE OFFICERS RETIREMENT PLAN

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$281	$281
B. OPERATING REVENUES		
1. Member Contributions	$35	$35
2. Employer Contributions	141	141
3. Investment Income	0	0
4. MPRIF Income	0	0
5. Net Realized Gain (Loss)	0	0
6. Other	0	0
7. Net Change in Unrealized Gain (Loss)	0	0
8. Total Revenue	$176	$176
C. OPERATING EXPENSES		
1. Service Retirements	$59	$59
2. Disability Benefits	0	0
3. Survivor Benefits	46	46
4. Refunds	0	0
5. Expenses	1	1
6. Other	0	0
7. Total Disbursements	$106	$106
D. OTHER CHANGES IN RESERVES	(36)	(36)
E. ASSETS AVAILABLE AT END OF PERIOD	$315	$315

TABLE 3

ELECTIVE STATE OFFICERS RETIREMENT PLAN

ACTIVE MEMBERS AS OF JUNE 30, 1989

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25									0
25-29									0
30-34									0
35-39									0
40-44			1						1
45-49		1	1						2
50-54				2					2
55-59									0
60-64				1					1
65+									0
TOTAL	0	1	2	3	0	0	0	0	6

AVERAGE ANNUAL EARNINGS

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25									0
25-29									0
30-34									0
35-39									0
40-44			54,821						54,821
45-49		51,859	77,858						64,859
50-54				57,310					57,310
55-59									0
60-64				99,655					99,655
65+									0
ALL	0	51,859	66,340	71,425	0	0	0	0	66,469

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE								
≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
0	52	133	214	0	0	0	0	399

TABLE 4

ELECTIVE STATE OFFICERS RETIREMENT PLAN

SERVICE RETIREMENTS AS OF JUNE 30, 1989

	YEARS RETIRED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64								0
65-69								0
70-74			1					1
75-79				2				2
80-84								0
85+								0
TOTAL	0	0	1	2	0	0	0	3

AVERAGE ANNUAL ANNUITY

	YEARS RETIRED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64								0
65-69								0
70-74			16,440					16,440
75-79				22,070				22,070
80-84								0
85+								0
ALL	0	0	16,440	22,070	0	0	0	20,193

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	0	17	44	0	0	0	61

TABLE 6

ELECTIVE STATE OFFICERS RETIREMENT PLAN

SURVIVORS AS OF JUNE 30, 1989

	YEARS SINCE DEATH							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64								0
65-69								0
70-74		1						1
75-79		1						1
80-84								0
85+					2	1		3
TOTAL	0	2	0	0	2	1	0	5

AVERAGE ANNUAL BENEFIT

	YEARS SINCE DEATH							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64								0
65-69								0
70-74		13,023						13,023
75-79		3,840						3,840
80-84								0
85+					11,581	7,427		10,196
ALL	0	8,432	0	0	11,581	7,427	0	9,490

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	17	0	0	23	7	0	47

TABLE 7

ELECTIVE STATE OFFICERS RETIREMENT PLAN

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1988	6	5	1
B. Additions	0	0	0
C. Deletions:			
1. Service Retirement	0	0	0
2. Disability	0		
3. Death	0	0	0
4. Terminated-Deferred	0		
5. Terminated-Refund	0	0	0
6. Terminated-Other Non-vested	0		
7. Returned as Active		0	0
D. Data Adjustments	0	1	(1)
Vested	3		
Non-Vested	3		
E. Total on June 30, 1989	6	6	0

	RECIPIENTS RETIREMENT ANNUITANTS	DISABLED	SURVIVORS
A. On June 30, 1988	3	NA	5
B. Additions	0		0
C. Deletions:			
1. Service Retirement			
2. Death	0		0
3. Annuity Expired	0		0
4. Returned as Active	0		
D. Data Adjustments	0		0
E. Total on June 30, 1989	3	NA	5

TABLE 8

ELECTIVE STATE OFFICERS RETIREMENT PLAN

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1989

A. CURRENT ASSETS (TABLE 1, F6)			$315
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			1,933
2. Present Value of Future Normal Costs			329
3. Total Expected Future Assets			$2,262
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$2,577
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$408	$408
b. Disability Benefits		0	0
c. Surviving Spouse and Child Benefits		302	302
2. Deferred Retirements with Future Augmentation		357	357
3. Former Members without Vested Rights		0	0
4. Active Members			
a. Retirement Annuities	86	714	800
b. Disability Benefits	0	0	0
c. Survivors' Benefits	22	0	22
d. Deferred Retirements	0	0	0
e. Refund Liability Due to Death or Withdrawal	0	49	49
5. Total Current Benefit Obligations	$108	$1,830	$1,938
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$492
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$2,430
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$1,623
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($147)

TABLE 9

ELECTIVE STATE OFFICERS RETIREMENT PLAN

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1989

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$1,264	$237	$1,027
b. Disability Benefits	0	0	0
c. Survivors Benefits	35	16	19
d. Deferred Retirements	0	0	0
e. Refunds Due to Death or Withdrawal	64	76	(12)
f. Total	$1,363	$329	$1,034
2. Deferred Retirements with Future Augmentation	$357		$357
3. Former Members Without Vested Rights	0		0
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	710		710
6. Total	$2,430	$329	$2,101

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$2,101
2. Current Assets (Table 1,F6)	315
3. UAAL (B1-B2)	$1,786
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$9,229
2. Supplemental Contribution Rate (B3/C1)	19.35%

TABLE 10

ELECTIVE STATE OFFICERS RETIREMENT PLAN

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1989

A. UAAL AT BEGINNING OF YEAR	$1,648
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$59
2. Contribution	(176)
3. Interest on A, B1, and B2	127
4. Total (B1+B2+B3)	$10
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$1,658
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	$0
2. Investment Return	24
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	61
5. Other Items	72
6. Total	$157
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D7)	$1,815
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	($29)
H. UAAL AT END OF YEAR (E+F+G)	$1,786

TABLE 11

ELECTIVE STATE OFFICERS RETIREMENT PLAN

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1989

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352C		
1. Employee Contributions	9.00%	$37
2. Employer Contributions	26.35%	107
3. Total	35.35%	$144
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	10.10%	$41
b. Disability Benefits	0.00%	0
c. Survivors	0.74%	3
d. Deferred Retirement Benefits	0.00%	0
e. Refunds Due to Death or Withdrawal	3.20%	13
f. Total	14.04%	$57
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $1,786	19.35%	$79
3. Allowance for Expenses	0.36%	$1
4. Total	33.75%	$137
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	1.60%	$7

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1989 is $406.

TABLE 12

ELECTIVE STATE OFFICERS RETIREMENT PLAN

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	CURRENT ASSETS YEAR END
1989					$315
1990	$144	$0	$107	$0	352
1991	228	0	189	0	391
1992	173	0	132	0	432
1993	194	0	150	0	476
1994	189	0	142	0	523
1995	196	0	146	0	573
1996	203	0	150	0	626
1997	235	0	178	0	683
1998	270	0	210	0	743
1999	269	0	205	0	807
2000	260	0	191	0	876
2001	261	0	188	0	949
2002	272	0	194	0	1,027
2003	273	0	190	0	1,110
2004	266	0	178	0	1,198
2005	319	0	225	0	1,292
2006	329	0	229	0	1,392
2007	338	0	231	0	1,499
2008	348	0	235	0	1,612
2009	401	0	280	0	1,733
2010	428	0	299	0	1,862
2011	425	0	288	0	1,999
2012	463	0	317	0	2,145
2013	474	0	319	0	2,300
2014	515	0	349	0	2,466
2015	497	0	321	0	2,642
2016	555	0	367	0	2,830
2017	583	0	383	0	3,030
2018	637	0	424	0	3,243
2019	658	0	431	0	3,470
2020	718	0	476	0	3,712

TABLE 13

ELECTIVE STATE OFFICERS RETIREMENT PLAN

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:

Pre-Retirement:
- Effective July 1, 1989: 8.5% per annum
- Prior to July 1, 1989: 8.0% per annum

Post-Retirement: 5.0% per annum

Salary Increases:

Reported salary at valuation date increased 2.5% to current fiscal year and 6.5% annually for each future year.

Mortality:

Pre-Retirement:
- Male - 1971 Group Annuity Mortality Table
- Female - 1971 Group Annuity Mortality Table male rates set back 8 years

Post-Retirement:
- Male - Same as above
- Female - Same as above

Post-Disability:
- Male - NA
- Female - NA

Retirement Age:

Age 62, or if over age 62, one year from the valuation date.

Separation:

Rates based on years of service:

Year	Rate
1	0%
2	0
3	0
4	50
5	0
6	0
7	0
8	50

Disability:

None

Expenses:

Prior year expenses expressed as percentage of prior year payroll. (0.36% of payroll)

Return of Contributions:

All employees withdrawing after 8 years of service were assumed to leave their contributions on deposit and receive a deferred annuitant benefit.

TABLE 13
(cont)

Family Composition:	85% of Members are married. Female is three years younger than male. Each Member may have up to two dependent children depending on the Member's age.
Social Security:	NA
Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Considerations:	NA
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method based on earnings and the date the employee entered the plan is applied to all plan benefits. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases 6.5% per annum.
Projected Cash Flow Method:	Cash flows for the Plan were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 14

ELECTIVE STATE OFFICERS RETIREMENT PLAN

SUMMARY OF PLAN PROVISIONS

Eligibility	Employment as a "Constitutional Officer".
Contributions	
Member	9% of Salary.
Employer	No statutory contributions.
Allowable Service	Service while in an eligible position.
Salary	Salary upon which Elective State Officers Retirement Plan contributions have been made.
Average Salary	Average of the 5 highest successive years of Salary.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 62 and 8 years of Allowable Service.
Amount	2.5% of Average Salary per year of Allowable Service.
Early Retirement Benefit	
Eligibility	Age 60 and 8 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.5% for each month the Member is under age 62 at time of retirement.
Form of Payment	Life annuity.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
DISABILITY	None.
DEATH	
Surviving Spouse Benefit	
Eligibility	Death while active or after retirement or with at least 8 years of Allowable Service.
Amount	Survivor's payment of 50% of the retirement benefit of the Member assuming the Member had attained age 62 and had a minimum of 8 years of Allowable Service. Benefit is paid for life or until remarriage. A former Member's benefit is augmented the same as a Deferred Annuity to date of death before determining the portion payable to the spouse.

TABLE 14
(cont)

Surviving Dependent Children's Benefit	
Eligibility	Same as spouse's benefit.
Amount	Benefit for first child is 25% of the retirement benefit (computed as for surviving spouse) with 12.5% for each additional child. Maximum payable (including spouse) is 100% of the retirement benefit. Benefits cease when a child marries or attains age 18 (22 if a full time student).
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of Service.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Benefit	
Eligibility	8 years of Allowable Service.
Amount	Benefit computed under law in effect at termination and increased by the following annual percentage: 0% before 7/1/79, 5% from 7/1/79 to 1/1/81, and 3% thereafter until the annuity begins. Amount is payable as a normal or early retirement.