1990 Actuarial Valuations

Section 1 - Elective State Officers Retirement Plan

Section 2 - Correctional Employees Retirement Plan

Section 3 - State Employees Retirement Fund

Section 4 - Legislators Retirement Plan

Section 5 - Judges Retirement Fund

Section 6 - State Patrol Retirement Fund

ELECTIVE STATE OFFICERS RETIREMENT PLAN

ACTUARIAL VALUATION REPORT

JULY 1, 1990

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

November 12, 1990

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, 1990 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)

	07/01/89 VALUATION	07/01/90 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352C % of Payroll	35.35%	47.79%
2. Required Contributions - Chapter 356 % of Payroll	33.75%	34.84%
3. Sufficiency (Deficiency) (A1-A2)	1.60%	12.95%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$315	$351
b. Current Benefit Obligations (Table 8)	$1,938	$2,108
c. Funding Ratio (a/b)	16.25%	16.65%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$315	$351
b. Actuarial Accrued Liability (Table 9)	$2,101	$2,271
c. Funding Ratio (a/b)	14.99%	15.46%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$2,577	$3,804
b. Current and Expected Future Benefit Obligations	$2,430	$2,575
c. Funding Ratio (a/b)	106.05%	147.73%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	6	6
b. Projected Annual Earnings	$406	$428
c. Average Annual Earnings (Actual $)	$67,618	$71,270
d. Average Age	51.1	52.1
e. Average Service	9.2	10.2
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)	6	6
e. Terminated Other Non-vested (Table 7)	0	0
f. Total	14	14

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 47.79%. Thus, the statutory contributions exceed the required contribution level of 34.84% by 12.95%. The section discussing contribution sufficiency describes the process of estimating the statutory employer contributions.

There was one change in plan provisions since the prior valuation. The interest rate credited on refund of member contributions was increased from 5% to 6%. This change did not have a significant impact on the calculation of the required contribution. All actuarial assumptions are the same as in the prior valuation.

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 year's ratio is 16.65%. The corresponding ratio for the prior year was 16.25%.

- 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 1990 the ratio is 15.46%, which is an increase from the 1989 value of 14.99%.

- o The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 147.73% 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.

<u>Asset Information (Tables 1 and 2)</u>

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:

- o 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.

- o 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, 1990 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the table on the following page.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$1,099,000
Current Employees -	
Accumulated employee contributions including allocated investment income	366,000 *
Employer-financed vested	513,000
Employer-financed nonvested	130,000
Total Pension Benefit Obligation	$2,108,000

* Estimated

The net assets available for benefits at cost is $351,000. The total Pension Benefit Obligation exceeds the assets by $1,757,000 to produce a funded ratio of 16.65%.

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 loss from salaries due to salaries increasing more than the expected increase.

- A loss from 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.

Each year the State pays the amounts required to make benefit payments during the year. (No benefits are paid from MPRIF.) Since these payments are considered employer contributions, they are included in the statutory contributions.

This report estimates the employer contributions 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 1991.

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 47.49% compared to the Required Contribution Rate of 34.84%.

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).

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 actuarial assumptions are the same as those used in the prior valuation.

Changes in Plan Provisions

This valuation reflects one change in plan provisions since the prior valuation. The interest rate credited on return of member contributions has been increased from 5% to 6%.

TABLE 1

ELECTIVE STATE OFFICERS RETIREMENT PLAN

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1990

	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	352	352
B. TOTAL ASSETS	$352	$352
C. AMOUNTS CURRENTLY PAYABLE	$1	$1
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$349	$349
2. State Reserves	(707)	(707)
3. MPRIF Reserves	0	0
4. Non-MPRIF Reserves	709	709
5. Total Assets Available for Benefits	$351	$351
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$352	$352

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$351
2. Market Value (D5)	$351	
3. Cost Value (D5)	351	
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")		$351

TABLE 2

ELECTIVE STATE OFFICERS RETIREMENT PLAN

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1990

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$315	$315
B. OPERATING REVENUES		
1. Member Contributions	$36	$36
2. Employer Contributions	112	112
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	$148	$148
C. OPERATING EXPENSES		
1. Service Retirements	$62	$62
2. Disability Benefits	0	0
3. Survivor Benefits	48	48
4. Refunds	0	0
5. Expenses	2	2
6. Other	0	0
7. Total Disbursements	$112	$112
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$351	$351

TABLE 3

ELECTIVE STATE OFFICERS RETIREMENT PLAN

ACTIVE MEMBERS AS OF JUNE 30, 1990

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									0
40-44			1						1
45-49		1	1						2
50-54					1				1
55-59				1					1
60-64					1				1
65+									0
TOTAL	0	1	2	1	2	0	0	0	6

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									0
40-44			55,474						55,474
45-49		52,472	79,082						65,777
50-54					55,474				55,474
55-59				60,520					60,520
60-64					100,843				100,843
65+									0
ALL	0	52,472	67,278	60,520	78,159	0	0	0	67,311

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	135	61	156	0	0	0	404

TABLE 4

ELECTIVE STATE OFFICERS RETIREMENT PLAN

SERVICE RETIREMENTS AS OF JUNE 30, 1990

	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								0
75-79				3				3
80-84								0
85+								0
TOTAL	0	0	0	3	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								0
75-79				21,009				21,009
80-84								0
85+								0
ALL	0	0	0	21,009	0	0	0	21,009

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	0	0	63	0	0	0	63

TABLE 6

ELECTIVE STATE OFFICERS RETIREMENT PLAN

SURVIVORS AS OF JUNE 30, 1990

AGE	YEARS SINCE DEATH ≤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+						3		3
TOTAL	0	2	0	0	0	3	0	5

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH ≤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		13,549						13,549
75-79		3,995						3,995
80-84								0
85+						10,608		10,608
ALL	0	8,772	0	0	0	10,608	0	9,874

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	18	0	0	0	31	0	49

ELECTIVE STATE OFFICERS RETIREMENT PLAN

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1989	6	6	0
B. Additions	0	0	0
C. Deletions:			
1. Service Retirement	0	0	0
2. Disability	0	0	0
3. Death	0	0	0
4. Terminated-Deferred	0	-	0
5. Terminated-Refund	0	0	0
6. Terminated-Other Non-vested	0	0	-
7. Returned as Active	-	0	0
D. Data Adjustments	0	0	0
Vested	3		
Non-Vested	3		
E. Total on June 30, 1990	6	6	0

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1989	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, 1990	3	NA	5

TABLE 8

ELECTIVE STATE OFFICERS RETIREMENT PLAN

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1990

A. CURRENT ASSETS (TABLE 1, F6)			$351
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			3,149
2. Present Value of Future Normal Costs			304
3. Total Expected Future Assets			$3,453
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$3,804
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$407	$407
b. Disability Benefits		0	0
c. Surviving Spouse and Child Benefits		302	302
2. Deferred Retirements with Future Augmentation		390	390
3. Former Members without Vested Rights		0	0
4. Active Members			
a. Retirement Annuities	106	815	921
b. Disability Benefits	0	0	0
c. Survivors' Benefits	24	0	24
d. Deferred Retirements	0	0	0
e. Refund Liability Due to Death or Withdrawal	0	64	64
5. Total Current Benefit Obligations	$130	$1,978	$2,108
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$467
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$2,575
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$1,757
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($1,229)

TABLE 9

ELECTIVE STATE OFFICERS RETIREMENT PLAN

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

JULY 1, 1990

	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	$1,370	$217	$1,153
b. Disability Benefits	0	0	0
c. Survivors Benefits	35	15	20
d. Deferred Retirements	0	0	0
e. Refunds Due to Death or Withdrawal	71	72	(1)
f. Total	$1,476	$304	$1,172
2. Deferred Retirements with Future Augmentation	$390		$390
3. Former Members Without Vested Rights	0		0
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	709		709
6. Total	$2,575	$304	$2,271

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$2,271
2. Current Assets (Table 1,F6)	351
3. UAAL (B1-B2)	$1,920
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$9,494
2. Supplemental Contribution Rate (B3/C1)	20.22%

TABLE 10

ELECTIVE STATE OFFICERS RETIREMENT PLAN

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

YEAR ENDING JUNE 30, 1990

A. UAAL AT BEGINNING OF YEAR	$1,786
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$58
2. Contribution	(148)
3. Interest on A, B1, and B2	148
4. Total (B1+B2+B3)	$58
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$1,844
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	$8
2. Investment Return	28
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	47
5. Other Items	(7)
6. Total	$76
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D7)	$1,920
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$1,920

TABLE 11

ELECTIVE STATE OFFICERS RETIREMENT PLAN

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1990

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352C		
1. Employee Contributions	9.00%	$38
2. Employer Contributions	38.79%	166
3. Total	47.79%	$204
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	10.05%	$43
b. Disability Benefits	0.00%	0
c. Survivors	0.93%	4
d. Deferred Retirement Benefits	0.00%	0
e. Refunds Due to Death or Withdrawal	3.27%	14
f. Total	14.25%	$61
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $1,920	20.22%	$86
3. Allowance for Expenses	0.37%	$2
4. Total	34.84%	$149
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	12.95%	$55

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1990 is $428.

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
1990					$351
1991	$204	$0	$166	$0	389
1992	184	0	143	0	430
1993	178	0	134	0	474
1994	200	0	154	0	520
1995	210	0	160	0	570
1996	219	0	166	0	623
1997	243	0	187	0	679
1998	276	0	216	0	739
1999	268	0	204	0	803
2000	268	0	200	0	871
2001	281	0	209	0	943
2002	284	0	207	0	1,020
2003	273	0	191	0	1,102
2004	266	0	179	0	1,189
2005	314	0	221	0	1,282
2006	317	0	218	0	1,381
2007	342	0	237	0	1,486
2008	352	0	240	0	1,598
2009	417	0	297	0	1,718
2010	412	0	285	0	1,845
2011	423	0	287	0	1,981
2012	457	0	313	0	2,125
2013	497	0	343	0	2,279
2014	515	0	351	0	2,443
2015	524	0	350	0	2,617
2016	531	0	345	0	2,803
2017	596	0	398	0	3,001
2018	649	0	438	0	3,212
2019	683	0	459	0	3,436
2020	719	0	480	0	3,675

TABLE 13

ELECTIVE STATE OFFICERS RETIREMENT PLAN

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:

Pre-Retirement: 8.5% per annum

Post-Retirement: 5.0% per annum

Salary Increases:

Reported salary at January 1 increased to current fiscal year by one-half of the known 1990 salary increase, 5.0% for the next year, and 6.5% annually for each future year thereafter.

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. (0.37% 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.

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:	Statutory employer contributions were assumed to be 100% of the disbursements for the following fiscal year found in Table 12.
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 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.
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.

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1990

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

November 12, 1990

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, 1990 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)

	07/01/89 VALUATION	07/01/90 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352 % of Payroll	13.60%	11.17%
2. Required Contributions - Chapter 356 % of Payroll	10.87%	10.73%
3. Sufficiency (Deficiency) (A1-A2)	2.73%	0.44%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	$85,441	$96,945
b. Current Benefit Obligations (Table 8)	$79,143	$87,554
c. Funding Ratio (a/b)	107.96%	110.73%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	$85,441	$96,945
b. Actuarial Accrued Liability (Table 9)	$92,684	$102,217
c. Funding Ratio (a/b)	92.19%	94.84%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$154,739	$146,925
b. Current and Expected Future Benefit Obligations	$128,657	$142,372
c. Funding Ratio (a/b)	120.27%	103.20%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	1,317	1,416
b. Projected Annual Earnings	$41,976	$47,075
c. Average Annual Earnings (Actual $)	$31,872	$33,245
d. Average Age	37.6	37.5
e. Average Service	8.2	8.1
2. Others		
a. Service Retirements (Table 4)	337	340
b. Disability Retirements (Table 5)	8	9
c. Survivors (Table 6)	12	15
d. Deferred Retirements (Table 7)	58	113
e. Terminated Other Non-vested (Table 7)	57	45
f. Total	472	522

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 continue to be sufficient. The margin of sufficiency has decreased from 2.73% of payroll in 1989 to 0.44% of payroll in 1990. The decrease in sufficiency is primarily the result of the reduction in the statutory employer contribution rate from 8.70% of payroll last year to 6.27% of payroll this year. According to this valuation a contribution rate of 10.73% is required to comply with Minnesota Law. All actuarial assumptions and all plan provisions, other than the change in the statutory employer contribution rate, are the same as in the prior valuation.

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 year's ratio is 110.73%. The corresponding ratio for the prior year was 107.96%.

- 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 1990 the ratio is 94.84%, which is an increase from the 1989 value of 92.19%.

- 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.

<u>Asset Information (Tables 1 and 2)</u>

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, 1991 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 1991 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, 1990 is provided below:

MPRIF Reserves	$31,241,000
Reserves Plus Excess Earnings	32,700,000
MPRIF Market Value	34,000,000

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 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, 1990 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$35,659,000
Current Employees -	
Accumulated employee contributions including allocated investment income	17,419,000 *
Employer-financed vested	31,038,000
Employer-financed nonvested	3,438,000
Total Pension Benefit Obligation	$87,554,000

* Estimated

The net assets available for benefits at cost is $95,015,000. The assets exceed the total Pension Benefit Obligation by $7,461,000 to produce a funded ratio of 108.52%.

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 5.6% compared to the expected 6.5%.

- A gain from Current Assets because the return was 12.7% instead of the assumed 8.5%.

- A loss of $1,400,000 (reported on line D5) due to fewer active members terminating than anticipated.

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 11.17% compared to the Required Contribution Rate of 10.73%.

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 1992 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 was one change in plan provisions since the prior valuation. The statutory employer contribution rate was decreased from 8.70% of payroll to 6.27% of payroll.

Changes in Actuarial Assumptions

The acturial assumptions are the same as those used in the prior valuation.

TABLE 1

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1990

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$1,864	$1,864
2. Investments		
a. Fixed Income	17,651	17,798
b. Equity	44,901	39,900
c. Real Estate	4,991	4,054
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	31,241	31,241
4. Other	275	275
B. TOTAL ASSETS	$100,923	$95,132
C. AMOUNTS CURRENTLY PAYABLE	$117	$117
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$13,452	$13,452
2. Employer Reserves	56,113	50,322
3. MPRIF Reserves	31,241	31,241
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	$100,806	$95,015
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$100,923	$95,132

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		$95,015
2. Market Value (D5)	$100,806	
3. Cost Value (D5)	95,015	
4. Market Over Cost (F2-F3)	$5,791	
5. 1/3 of Market Over Cost(F4)/3		1,930
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$96,945

TABLE 2

CORRECTIONAL EMPLOYEES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1990

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	$89,909	$83,207
B. OPERATING REVENUES		
1. Member Contributions	$1,926	$1,926
2. Employer Contributions	3,412	3,412
3. Investment Income	6,132	6,132
4. MPRIF Income	2,529	2,529
5. Net Realized Gain (Loss)	1,472	1,472
6. Other	1	1
7. Net Change in Unrealized Gain (Loss)	(911)	0
8. Total Revenue	$14,561	$15,472
C. OPERATING EXPENSES		
1. Service Retirements	$3,081	$3,081
2. Disability Benefits	107	107
3. Survivor Benefits	0	0
4. Refunds	247	247
5. Expenses	222	222
6. Other	35	35
7. Total Disbursements	$3,692	$3,692
D. OTHER CHANGES IN RESERVES	28	28
E. ASSETS AVAILABLE AT END OF YEAR	$100,806	$95,015

TABLE 3

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1990

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	45	33							78
25-29	61	135	42	1					239
30-34	29	84	142	35					290
35-39	25	53	75	102	26				281
40-44	17	33	65	75	51	11	1		253
45-49	7	20	23	39	19	19	7		134
50-54	1	7	16	22	23	17	9	2	97
55-59	2	4	5	11	4	4		2	32
60-64	1			4	3	2	2		12
65+									0
TOTAL	188	369	368	289	126	53	19	4	1,416

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	18,122	19,365							18,648
25-29	20,670	23,943	27,705	31,415					23,800
30-34	20,094	24,638	29,177	30,915					27,164
35-39	23,071	25,456	29,601	31,765	34,973				29,521
40-44	20,790	26,352	29,687	31,736	35,408	35,092	28,013		30,643
45-49	23,567	27,556	30,205	33,150	34,384	35,796	29,548		31,671
50-54	21,947	29,292	28,935	31,466	34,013	35,967	33,440	33,748	32,417
55-59	28,624	29,600	30,546	32,542	41,373	31,363		43,003	33,228
60-64	28,920			35,585	31,501	41,605	31,139		34,271
65+									0
ALL	20,545	24,483	29,258	31,900	35,006	35,589	31,478	38,376	28,200

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
3,862	9,034	10,767	9,219	4,411	1,886	598	154	39,931

TABLE 4

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	3							3
55-59	12	47						59
60-64	2	13	50					65
65-69		5	29	54				88
70-74			7	46	18			71
75-79				20	31			51
80-84					3			3
85+								0
TOTAL	17	65	86	120	52	0	0	340

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	7,259							7,259
55-59	10,248	8,562						8,905
60-64	6,869	6,807	8,935					8,446
65-69		8,241	7,840	8,279				8,132
70-74			4,705	5,630	6,716			5,814
75-79				3,846	5,153			4,640
80-84					7,605			7,605
85+								0
ALL	9,323	8,186	8,221	6,524	5,835	0	0	7,306

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
158	532	707	784	303	0	0	2,484

TABLE 5

CORRECTIONAL EMPLOYEES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1990

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

AVERAGE ANNUAL BENEFIT

	YEARS DISABLED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		4,050	3,484					3,937
50-54			6,033					6,033
55-59		2,947	3,251					3,099
60-64			13,245					13,245
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	3,829	6,503	0	0	0	0	5,018

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	19	26	0	0	0	0	45

TABLE 6

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1990

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

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		3,653	4,099					3,801
50-54								0
55-59		6,489	5,745					6,303
60-64		4,751						4,751
65-69		2,515		4,797	2,880			3,500
70-74			3,710					3,710
75-79				4,932				4,932
80-84								0
85+								0
ALL	0	4,569	4,518	4,842	2,880	0	0	4,501

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	37	13	15	3	0	0	68

TABLE 7

CORRECTIONAL EMPLOYEES RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1989	1,317	58	57
B. Additions	200	62	14
C. Deletions:			
1. Service Retirement	(18)	(3)	0
2. Disability	0	(1)	0
3. Death	(1)	0	(5)
4. Terminated-Deferred	(32)	-	(7)
5. Terminated-Refund	(40)	(2)	0
6. Terminated-Other Non-vested	(12)	0	-
7. Returned as Active	-	(1)	(3)
D. Data Adjustments	2	0	(11)
Vested	1,039		
Non-Vested	377		
E. Total on June 30, 1990	1,416	113	45

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1989	337	8	12
B. Additions	20	1	2
C. Deletions:			
1. Service Retirement	-	0	-
2. Death	(17)	(2)	0
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	-
D. Data Adjustments	0	2	1
E. Total on June 30, 1990	340	9	15

TABLE 8

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1990

A. CURRENT ASSETS (TABLE 1, F6)			$96,945
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			9,825
2. Present Value of Future Normal Costs			40,155
3. Total Expected Future Assets			49,980
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$146,925
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$29,471	$29,471
b. Disability Benefits		859	859
c. Surviving Spouse and Child Benefits		911	911
2. Deferred Retirements with Future Augmentation		4,274	4,274
3. Former Members without Vested Rights		144	144
4. Active Members			
a. Retirement Annuities	489	34,020	34,509
b. Disability Benefits	1,075	0	1,075
c. Survivors' Benefits	1,492	0	1,492
d. Deferred Retirements	382	13,528	13,910
e. Refund Liability Due to Death or Withdrawal	0	909	909
5. Total Current Benefit Obligations	$3,438	$84,116	$87,554
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$54,818
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$142,372
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			($9,391)
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($4,553)

CORRECTIONAL EMPLOYEES RETIREMENT FUND

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

JULY 1, 1990

	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	$75,046	$24,276	$50,770
b. Disability Benefits	2,073	874	1,199
c. Survivors Benefits	2,972	1,009	1,963
d. Deferred Retirements	25,023	11,639	13,384
e. Refunds Due to Death or Withdrawal	1,599	2,357	(758)
f. Total	$106,713	$40,155	$66,558
2. Deferred Retirements with Future Augmentation	$4,274		$4,274
3. Former Members Without Vested Rights	144		144
4. Annuitants in MPRIF	31,241		31,241
5. Recipients Not in MPRIF	0		0
6. Total	$142,372	$40,155	$102,217

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$102,217
2. Current Assets (Table 1, F6)	96,945
3. UAAL (B1-B2)	$5,272
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$1,045,172
2. Supplemental Contribution Rate (B3/C1)	0.50%

TABLE 10

CORRECTIONAL EMPLOYEES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1990

A. UAAL AT BEGINNING OF YEAR	$7,243
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$3,974
2. Contribution	(5,338)
3. Interest on A, B1, and B2	558
4. Total (B1+B2+B3)	($806)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$6,437
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($1,176)
2. Investment Return	(2,419)
3. MPRIF Mortality	(95)
4. Mortality of Other Benefit Recipients	0
5. Other Items	2,525
6. Total	($1,165)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$5,272
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$5,272

TABLE 11

CORRECTIONAL EMPLOYEES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1990

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352		
1. Employee Contributions	4.90%	$2,307
2. Employer Contributions	6.27%	2,952
3. Total	11.17%	$5,259
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	5.96%	$2,801
b. Disability Benefits	0.21%	101
c. Survivors	0.24%	114
d. Deferred Retirement Benefits	2.71%	1,278
e. Refunds Due to Death or Withdrawal	0.55%	258
f. Total	9.67%	$4,552
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $5,272	0.50%	$235
3. Allowance for Expenses	0.56%	$264
4. Total	10.73%	$5,051
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	0.44%	$208

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1990 is $47,075

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
1990					$65,704
1991	$5,259	$896	$436	$5,752	75,383
1992	5,600	3,381	460	6,482	83,624
1993	5,964	1,867	500	7,261	94,482
1994	6,352	2,504	537	8,172	105,965
1995	6,765	3,646	584	9,115	117,615
1996	7,204	4,531	635	10,084	129,737
1997	7,673	4,367	686	11,139	143,496
1998	8,171	4,348	751	12,328	158,896
1999	8,702	5,845	794	13,594	174,553
2000	9,268	5,356	848	14,967	192,584
2001	9,870	6,065	910	16,493	211,972
2002	10,512	8,069	980	18,080	231,515
2003	11,195	10,173	1,047	19,678	251,168
2004	11,923	11,719	1,120	21,310	271,562
2005	12,698	16,581	1,205	22,867	289,341
2006	13,523	15,701	1,290	24,447	310,320
2007	14,402	13,216	1,387	26,369	336,488
2008	15,339	18,969	1,487	28,384	359,755
2009	16,336	18,792	1,590	30,407	386,116
2010	17,397	20,688	1,705	32,608	413,728
2011	18,528	22,613	1,819	34,916	442,740
2012	19,733	16,248	1,934	37,699	481,990
2013	21,015	26,929	2,061	40,630	514,645
2014	22,381	23,395	2,193	43,609	555,047
2015	23,836	24,499	2,344	47,051	599,091
2016	25,385	24,704	2,484	50,846	648,134
2017	27,035	23,424	2,636	55,133	704,242
2018	28,793	32,210	2,801	59,596	757,620
2019	30,664	31,184	2,976	64,249	818,373
2020	32,657	30,988	3,161	69,498	886,379

TABLE 13

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8.5% 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. (0.56% 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.
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

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 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	6.27% of Salary. <u>(Amended 1990)</u>
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.
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.
Amount	2.5% of Average Salary for each year of Allowable Service, pro rata for completed months. Maximum of 75% of Average Salary. 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 3 years of Allowable Service.

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.
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
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.
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. 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.
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 15 years) and Average Salary at disability.

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.
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.

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.
Deferred Annuity	
Eligibility	3 years of Correctional and General Service.
Amount	Benefit computed under law in effect at termination.

STATE EMPLOYEES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1990

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

November 12, 1990

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, 1990 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

STATE EMPLOYEES RETIREMENT FUND

TABLE OF CONTENTS

STATE EMPLOYEES RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/89 VALUATION	07/01/90 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352 % of Payroll	8.85%	8.44%
2. Required Contributions - Chapter 356 % of Payroll	8.14%	8.17%
3. Sufficiency (Deficiency) (A1-A2)	0.71%	0.27%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	$1,871,542	$2,108,210
b. Current Benefit Obligations (Table 8)	$2,109,272	$2,328,167
c. Funding Ratio (a/b)	88.73%	90.55%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	$1,871,542	$2,108,210
b. Actuarial Accrued Liability (Table 9)	$2,456,686	$2,707,968
c. Funding Ratio (a/b)	76.18%	77.85%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$3,467,695	$3,635,489
b. Current and Expected Future Benefit Obligations	$3,239,884	$3,546,369
c. Funding Ratio (a/b)	107.03%	102.51%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	48,653	49,576
b. Projected Annual Earnings	$1,418,160	$1,513,522
c. Average Annual Earnings (Actual $)	$29,148	$30,529
d. Average Age	40.5	40.9
e. Average Service	9.4	9.6
2. Others		
a. Service Retirements (Table 4)	11,564	11,810
b. Disability Retirements (Table 5)	665	676
c. Survivors (Table 6)	850	899
d. Deferred Retirements (Table 7)	1,355	1,824
e. Terminated Other Non-vested (Table 7)	3,924	4,638
f. Total	18,358	19,847

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 continue to be sufficient. The margin of sufficiency has decreased from 0.71% of payroll in 1989 to 0.27% of payroll in 1990. The decrease in sufficiency is primarily the result of the reduction in the statutory employee and employer contribution rates from 8.85% of payroll last year to 8.44% of payroll this year. According to this valuation a contribution rate of 8.17% is required to comply with Minnesota Law. All actuarial assumptions and all plan provisions, other than the change in the statutory contribution rates, are the same as in the prior valuation.

The financial status of the Fund 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 year's ratio is 90.55%. The corresponding ratio for the prior year was 88.73%.

- 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 1990 the ratio is 77.85%, which is an increase from the 1989 value of 76.18%.

- 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.

<u>Asset Information (Tables 1 and 2)</u>

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, 1991 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 1991 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, 1990 is provided below:

MPRIF Reserves	$766,790,000
Reserves Plus Excess Earnings	803,000,000
MPRIF Market Value	835,000,000

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, 1990 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$805,724,000
Current Employees -	
Accumulated employee contributions including allocated investment income	510,045,000 *
Employer-financed vested	867,448,000
Employer-financed nonvested	144,950,000
Total Pension Benefit Obligation	$2,328,167,000

* Estimated

The net assets available for benefits at cost is $2,067,688,000. The total Pension Benefit Obligation exceeds the assets by $260,479,000 to produce a funded ratio of 88.81%.

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.

<u>Sources of Actuarial Gains and Losses (Table 10)</u>

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 4.8% compared to the expected 6.5%.

- A gain from Current Assets because the return was 12.7% instead of the assumed 8.5%.
- A loss of $56,000,000 (reported on line D5) due to fewer active members terminating than anticipated.

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 8.44% compared to the Required Contribution Rate of 8.17%.

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 1992 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 two changes in plan provisions since the prior valuation. The statutory employer contribution rate was reduced from 4.51% to 4.29% of payroll and the statutory employee rate was reduced from 4.34% to 4.15% of payroll.

Changes in Actuarial Assumptions

The actuarial assumptions are the same as those used in the prior valuation.

TABLE 1

STATE EMPLOYEES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1990

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$20,407	$20,407
2. Investments		
a. Fixed Income	364,924	368,116
b. Equity	928,309	823,390
c. Real Estate	103,191	83,352
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	766,790	766,790
4. Other	6,010	6,010
B. TOTAL ASSETS	$2,189,631	$2,068,065
C. AMOUNTS CURRENTLY PAYABLE	$377	$377
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$355,216	$355,216
2. Employer Reserves	1,060,533	938,967
3. MPRIF Reserves	766,790	766,790
4. Non-MPRIF Reserves	6,715	6,715
5. Total Assets Available for Benefits	$2,189,254	$2,067,688
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$2,189,631	$2,068,065

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$2,067,688
2. Market Value (D5)	$2,189,254	
3. Cost Value (D5)	2,067,688	
4. Market Over Cost (F2-F3)	$121,566	
5. 1/3 of Market Over Cost(F4)/3		40,522
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$2,108,210

TABLE 2

STATE EMPLOYEES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1990

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	$1,965,794	$1,824,416
B. OPERATING REVENUES		
1. Member Contributions	$55,671	$55,671
2. Employer Contributions	57,200	57,200
3. Investment Income	125,915	125,915
4. MPRIF Income	62,801	62,801
5. Net Realized Gain (Loss)	31,376	31,376
6. Other (Includes State Appropriation)	29	29
7. Net Change in Unrealized Gain (Loss)	(19,812)	0
8. Total Revenue	$313,180	$332,992
C. OPERATING EXPENSES		
1. Service Retirements	$73,201	$73,201
2. Disability Benefits	2,839	2,839
3. Survivor Benefits	0	0
4. Refunds	8,203	8,203
5. Expenses	3,726	3,726
6. Other	1,046	1,046
7. Total Disbursements	$89,015	$89,015
D. OTHER CHANGES IN RESERVES	(705)	(705)
E. ASSETS AVAILABLE AT END OF YEAR	$2,189,254	$2,067,688

TABLE 3

STATE EMPLOYEES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1990

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	1,148	847	59						2,054
25-29	1,255	3,007	1,271	221					5,754
30-34	1,150	2,842	2,358	1,686	154				8,190
35-39	975	2,432	2,087	2,396	1,406	144			9,440
40-44	685	1,762	1,479	1,868	1,702	931	86		8,513
45-49	379	977	856	1,041	851	916	466	35	5,521
50-54	232	552	626	736	586	553	465	342	4,092
55-59	154	336	408	559	523	478	340	509	3,307
60-64	85	162	278	407	363	382	196	248	2,121
65+	32	49	74	124	109	101	41	54	584
TOTAL	6,095	12,966	9,496	9,038	5,694	3,505	1,594	1,188	49,576

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	5,171	17,339	18,263						10,565
25-29	8,023	21,171	22,890	23,064					18,756
30-34	8,354	22,391	25,033	26,206	26,804				22,049
35-39	8,799	23,530	26,294	28,558	29,394	28,265			24,841
40-44	8,917	23,884	26,834	30,258	32,636	32,541	31,466		27,364
45-49	8,877	23,749	26,573	29,907	32,956	34,176	36,258	32,998	28,591
50-54	7,575	22,541	24,775	28,141	30,833	31,675	35,640	36,702	28,135
55-59	6,700	21,131	25,231	28,015	29,502	31,004	34,115	37,427	28,723
60-64	5,731	21,300	23,754	27,150	28,468	29,895	30,748	36,586	27,555
65+	2,031	20,408	19,044	25,139	30,371	29,054	29,175	32,451	25,317
ALL	7,712	22,250	25,308	28,314	30,943	32,057	34,503	36,686	24,585

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
47,005	288,488	240,325	255,899	176,190	112,361	54,997	43,583	1,218,848

TABLE 4

STATE EMPLOYEES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1990

	YEARS RETIRED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54		5						5
55-59	95	159						254
60-64	268	972	172					1,412
65-69	215	1,539	1,199	18				2,971
70-74	16	248	1,862	619	16			2,761
75-79		3	237	1,610	311	14		2,175
80-84			2	256	926	84	17	1,285
85+				7	247	451	242	947
TOTAL	594	2,926	3,472	2,510	1,500	549	259	11,810

AVERAGE ANNUAL ANNUITY

	YEARS RETIRED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54		5,653						5,653
55-59	8,392	7,678						7,945
60-64	6,815	7,336	9,055					7,447
65-69	6,077	6,120	7,585	6,323				6,709
70-74	5,410	5,226	6,129	6,730	3,283			6,162
75-79		2,754	5,849	4,981	5,410	2,568		5,118
80-84			8,569	4,167	4,644	3,063	2,738	4,426
85+				8,191	4,061	3,179	3,117	3,430
ALL	6,762	6,529	6,759	5,348	4,692	3,146	3,092	5,891

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
4,017	19,102	23,467	13,423	7,038	1,727	801	69,575

TABLE 5

STATE EMPLOYEES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1990

	YEARS DISABLED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	13	18	11	2				44
50-54	10	15	7	3	2			37
55-59	9	30	16	6				61
60-64	15	53	39	12	6	1		126
65-69		23	73	52	15	7	1	171
70-74			14	89	21	4	2	130
75-79				35	26	8	2	71
80-84					13	9	1	23
85+						2	11	13
TOTAL	47	139	160	199	83	31	17	676

AVERAGE ANNUAL BENEFIT

	YEARS DISABLED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	5,404	2,815	4,230	3,573				3,968
50-54	3,913	4,830	3,715	4,921	2,070			4,229
55-59	5,307	5,108	4,717	4,005				4,927
60-64	6,012	3,868	5,084	5,130	3,201	1,970		4,573
65-69		4,269	4,339	4,148	3,399	3,086	3,606	4,134
70-74			3,760	4,192	3,700	2,848	2,672	4,002
75-79				4,187	3,552	2,933	3,470	3,793
80-84					3,315	2,951	3,606	3,185
85+						1,893	2,775	2,639
TOTAL	5,262	4,169	4,473	4,236	3,464	2,864	2,942	4,159

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
247	580	716	843	287	89	50	2,812

TABLE 6

STATE EMPLOYEES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1990

AGE	YEARS SINCE DEATH ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	3	18	8	1				30
50-54	2	14	4			1		21
55-59	7	42	15	1		1		66
60-64	9	59	61	7	3		1	140
65-69	3	31	91	41	9	1	1	177
70-74		13	65	56	18	1	4	157
75-79		4	21	49	42	5	5	126
80-84			4	14	47	14	21	100
85+			1	1	12	29	39	82
TOTAL	24	181	270	170	131	52	71	899

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	1,969	3,997	3,416	2,633				3,594
50-54	7,046	4,604	3,952			2,287		4,602
55-59	5,368	5,233	4,576	5,155		1,445		5,039
60-64	5,691	5,115	6,314	4,470	3,141		2,156	5,579
65-69	2,855	4,970	5,913	4,265	2,687	584	2,138	5,099
70-74		5,768	5,256	5,193	4,027	2,106	1,597	5,022
75-79		6,319	3,801	5,032	4,271	2,349	1,988	4,387
80-84			4,398	4,546	4,876	2,095	2,237	3,867
85+			17,992	3,444	4,384	2,395	2,144	2,770
ALL	4,890	5,040	5,526	4,814	4,330	2,249	2,130	4,645

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
117	912	1,494	818	567	117	151	4,176

TABLE 7

STATE EMPLOYEES RETIREMENT FUND

RECONCILIATION OF MEMBERS

		TERMINATED	
	ACTIVES	DEFERRED RETIREMENT	OTHER NON-VESTED
A. On June 30, 1989	48,653	1,355	3,924
B. Additions	6,318	682	1,894
C. Deletions:			
1. Service Retirement	(647)	(77)	(7)
2. Disability	(51)	(7)	0
3. Death	(71)	(8)	(3)
4. Terminated-Deferred	(576)	-	(31)
5. Terminated-Refund	(2,553)	(46)	(448)
6. Terminated-Other Non-vested	(1,406)	(3)	-
7. Returned as Active	-	(64)	(145)
D. Data Adjustments	(91)	(8)	(546)
Vested	34,869		
Non-Vested	14,707		
E. Total on June 30, 1990	49,576	1,824	4,638

	RECIPIENTS		
	RETIREMENT ANNUITANTS	DISABLED	SURVIVORS
A. On June 30, 1989	11,564	665	850
B. Additions	726	72	108
C. Deletions:			
1. Service Retirement		0	
2. Death	(514)	(57)	(29)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	34	(4)	(30)
E. Total on June 30, 1990	11,810	676	899

TABLE 8

STATE EMPLOYEES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1990

A. CURRENT ASSETS (TABLE 1, F6)			$2,108,210
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			688,878
2. Present Value of Future Normal Costs			838,401
3. Total Expected Future Assets			1,527,279
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$3,635,489

D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$696,983	$696,983
b. Disability Benefits		30,761	30,761
c. Surviving Spouse and Child Benefits		45,761	45,761
2. Deferred Retirements with Future Augmentation		29,938	29,938
3. Former Members without Vested Rights		2,281	2,281
4. Active Members			
a. Retirement Annuities	12,750	1,033,255	1,046,005
b. Disability Benefits	56,393	0	56,393
c. Survivors' Benefits	67,017	0	67,017
d. Deferred Retirements	8,790	313,696	322,486
e. Refund Liability Due to Death or Withdrawal	0	30,542	30,542
5. Total Current Benefit Obligations	$144,950	$2,183,217	$2,328,167

E. EXPECTED FUTURE BENEFIT OBLIGATIONS	$1,218,202
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS	$3,546,369
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)	$219,957
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)	($89,120)

TABLE 9

STATE EMPLOYEES RETIREMENT FUND

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

JULY 1, 1990

	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	$1,938,810	$483,029	$1,455,781
b. Disability Benefits	104,538	35,400	69,138
c. Survivors Benefits	122,026	38,455	83,571
d. Deferred Retirements	523,613	197,848	325,765
e. Refunds Due to Death or Withdrawal	51,658	83,669	(32,011)
f. Total	$2,740,645	$838,401	$1,902,244
2. Deferred Retirements with Future Augmentation	$29,938		$29,938
3. Former Members Without Vested Rights	2,281		2,281
4. Annuitants in MPRIF	766,790		766,790
5. Recipients Not in MPRIF	6,715		6,715
6. Total	$3,546,369	$838,401	$2,707,968

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$2,707,968
2. Current Assets (Table 1, F6)	2,108,210
3. UAAL (B1-B2)	$599,758
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$33,603,819
2. Supplemental Contribution Rate (B3/C1)	1.78%

TABLE 10

STATE EMPLOYEES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1990

A. UAAL AT BEGINNING OF YEAR	$585,144
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$81,198
2. Contribution	(112,871)
3. Interest on A, B1, and B2	48,391
4. Total (B1+B2+B3)	$16,718
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$601,862
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($34,631)
2. Investment Return	(49,372)
3. MPRIF Mortality	(1,628)
4. Mortality of Other Benefit Recipients	0
5. Other Items	83,527
6. Total	($2,104)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$599,758
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$599,758

TABLE 11

STATE EMPLOYEES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1990

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352		
1. Employee Contributions	4.15%	$62,811
2. Employer Contributions	4.29%	64,930
3. Total	8.44%	$127,741
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	3.54%	$53,595
b. Disability Benefits	0.25%	3,751
c. Survivors	0.27%	4,036
d. Deferred Retirement Benefits	1.38%	20,859
e. Refunds Due to Death or Withdrawal	0.66%	10,020
f. Total	6.10%	$92,261
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $599,758	1.78%	$26,941
3. Allowance for Expenses	0.29%	$4,389
4. Total	8.17%	$123,591
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	0.27%	$4,150

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1990 is $1,513,522

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
1990					$1,341,420
1991	$127,741	$61,022	$11,763	$116,356	1,512,732
1992	136,044	130,533	12,372	128,291	1,634,162
1993	144,887	92,177	13,192	140,583	1,814,263
1994	154,305	106,154	14,062	155,661	2,004,013
1995	164,335	117,925	15,220	171,667	2,206,870
1996	175,017	132,108	16,561	188,704	2,421,922
1997	186,393	146,306	17,669	206,816	2,651,156
1998	198,508	159,911	19,022	226,180	2,896,911
1999	211,411	179,784	20,553	246,708	3,154,693
2000	225,153	206,709	21,990	267,998	3,419,145
2001	239,788	228,021	23,685	290,121	3,697,348
2002	255,374	265,467	25,328	312,769	3,974,696
2003	271,973	304,658	27,169	335,305	4,250,147
2004	289,652	327,785	29,285	358,397	4,541,126
2005	308,479	382,633	31,324	381,513	4,817,161
2006	328,530	416,616	33,585	404,288	5,099,778
2007	349,885	467,673	36,049	426,943	5,372,884
2008	372,627	502,139	38,719	449,545	5,654,198
2009	396,848	538,334	41,640	472,824	5,943,896
2010	422,643	603,990	44,729	495,623	6,213,443
2011	450,115	637,815	48,020	518,125	6,495,848
2012	479,372	667,049	51,601	541,978	6,798,548
2013	510,531	687,087	55,274	568,024	7,134,742
2014	543,716	687,292	59,135	597,838	7,529,869
2015	579,058	771,190	63,189	629,188	7,903,736
2016	616,696	745,491	67,276	663,485	8,371,150
2017	656,782	754,485	71,764	704,345	8,906,028
2018	699,472	744,302	76,299	751,864	9,536,763
2019	744,938	779,920	81,019	805,695	10,226,457
2020	793,359	873,771	85,996	862,177	10,922,226

TABLE 13

STATE EMPLOYEES RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8.5% 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. (0.29% 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

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

	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		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	4.15% of Salary. (Amended 1990)
Employer	4.29% of Salary. (Amended 1990)
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.
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.
Amount	1.5% of Average Salary for each year of Allowable Service.
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.

TABLE 14
(cont)

	First hired after June 30, 1989: Age 55 with 3 years of Allowable Service.
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.
	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.
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.
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.

	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.
DISABILITY	
Disability Benefit	
Eligibility	Total and permanent disability before normal retirement age with 3 years of Allowable Service.
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.

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.
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.
Deferred Benefit	
Eligibility	3 years of Allowable Service.
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.

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	$202,735
3.	Normal Cost	
	a. Dollar Amount	$ 14,953
	b. Percent of Payroll	7.38%

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	$252,931
3. Normal Cost	
a. Dollar Amount	$ 22,340
b. Percent of Payroll	8.83%

LEGISLATORS RETIREMENT PLAN

ACTUARIAL VALUATION REPORT

JULY 1, 1990

THE Wyatt COMPANY

)CTUARIAL SERVICES
)PENSATION 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

November 12, 1990

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, 1990 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)

	07/01/89 VALUATION	07/01/90 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 3A % of Payroll	26.34%	30.89%
2. Required Contributions - Chapter 356 % of Payroll	31.52%	32.62%
3. Sufficiency (Deficiency) (A1-A2)	-5.18%	-1.73%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$12,317	$12,748
b. Current Benefit Obligations (Table 8)	$26,998	$29,654
c. Funding Ratio (a/b)	45.62%	42.99%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$12,317	$12,748
b. Actuarial Accrued Liability (Table 9)	$28,821	$31,322
c. Funding Ratio (a/b)	42.74%	40.70%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$32,712	$39,671
b. Current and Expected Future Benefit Obligations	$39,361	$41,958
c. Funding Ratio (a/b)	83.11%	94.55%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	201	201
b. Projected Annual Earnings	$6,114	$6,429
c. Average Annual Earnings (Actual $)	$30,416	$31,987
d. Average Age	48.4	49.4
e. Average Service	7.7	8.7
2. Others		
a. Service Retirements (Table 4)	125	126
b. Disability Retirements (Table 5)	NA	NA
c. Survivors (Table 6)	36	37
d. Deferred Retirements (Table 7)	95	101
e. Terminated Other Non-vested (Table 7)	16	3
f. Total	272	267

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 30.89%. The remaining 1.73% needed to reach the required contribution level of 32.62% will be paid by the State as needed in future years according to Chapter 3A of Minnesota Statutes. The section discussing contribution sufficiency describes the process of estimating the statutory employer contributions.

There was one change in plan provisions since the prior valuation. The interest rate credited on refund of member contributions was increased from 5% to 6%. This change did not have a significant impact on the calculation of the required contribution. All actuarial assumptions are the same as in the prior valuation.

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 year's ratio is 42.99%. The corresponding ratio for the prior year was 45.62%.

- 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 1990 the ratio is 40.70% which is a decrease from the 1989 value of 42.74%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 94.55% 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.

<u>Asset Information (Tables 1 and 2)</u>

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, 1990 is provided below:

MPRIF Reserves	$8,809,000
Reserves Plus Excess Earnings	9,200,000
MPRIF Market Value	9,600,000

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.

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.

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, 1990 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$17,527,000
Current Employees -	
Accumulated employee contributions including allocated investment income	4,224,000 *
Employer-financed vested	6,372,000
Employer-financed nonvested	1,531,000
Total Pension Benefit Obligation	$29,654,000

* Estimated

The net assets available for benefits at cost is $12,748,000. The total Pension Benefit Obligation exceeds the assets by $16,906,000 to produce a funded ratio of 42.99%.

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 due to salary increases less that 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.

Each year the State pays the amounts required to fund new annuities from MPRIF and to make other benefit payments during the year. These payments are considered employer contributions and are shown as statutory contributions.

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 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 30.89% compared to the Required Contribution Rate of 32.62%. 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.

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).

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

This valuation reflects one change in plan provisions since the prior valuation. The interest rate on refund of member contributions has been increased from 5% to 6%.

Changes in Actuarial Assumptions

The actuarial assumptions are the same as those used in the prior valuation.

TABLE 1

LEGISLATORS RETIREMENT PLAN

ACCOUNTING BALANCE SHEET (DOLLARS IN THOUSANDS)

July 1, 1990

	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)	8,809	8,809
4. Other	4,154	4,154
B. TOTAL ASSETS	$12,963	$12,963
C. AMOUNTS CURRENTLY PAYABLE	$215	$215
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$4,117	$4,117
2. State Reserves	(4,030)	(4,030)
3. MPRIF Reserves	8,809	8,809
4. Non-MPRIF Reserves	3,852	3,852
5. Total Assets Available for Benefits	$12,748	$12,748
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$12,963	$12,963

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		$12,748
2. Market Value (D5)	$12,748	
3. Cost Value (D5)	12,748	
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")		$12,748

TABLE 2

LEGISLATORS RETIREMENT PLAN

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1990

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$12,317	$12,317
B. OPERATING REVENUES		
1. Member Contributions	$546	$546
2. Employer Contributions	451	451
3. Investment Income	0	0
4. MPRIF Income	764	764
5. Net Realized Gain (Loss)	0	0
6. Other	0	0
7. Net Change in Unrealized Gain (Loss)	0	0
8. Total Revenue	$1,761	$1,761
C. OPERATING EXPENSES		
1. Service Retirements	$1,089	$1,089
2. Disability Benefits	0	0
3. Survivor Benefits	173	173
4. Refunds	30	30
5. Expenses	37	37
6. Other	1	1
7. Total Disbursements	$1,330	$1,330
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$12,748	$12,748

LEGISLATORS RETIREMENT PLAN

ACTIVE MEMBERS AS OF JUNE 30, 1990

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25									0
25-29		2							2
30-34		6	3						9
35-39		10	15	3					28
40-44		11	15	2	3				31
45-49	1	10	10	8	7				36
50-54		5	12	10	5				32
55-59	1	4	10	11	4	1			31
60-64		2	8	5	6	3			24
65+		1	4	1	1			1	8
TOTAL	2	51	77	40	26	4	0	1	201

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		29,035							29,035
30-34		28,578	29,034						28,730
35-39		28,981	29,173	29,034					29,090
40-44		29,034	28,817	29,035	29,034				28,929
45-49	29,034	28,981	29,034	29,034	29,034				29,019
50-54		28,965	29,008	28,708	29,034				28,911
55-59	29,034	28,902	29,035	28,999	29,035	27,320			28,949
60-64		29,035	29,035	29,034	29,035	27,320			28,820
65+		29,034	29,035	29,034	29,034			27,224	28,808
ALL	29,034	28,943	29,015	28,943	29,034	27,320	0	27,224	28,942

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
58	1,476	2,234	1,158	755	109	0	27	5,817

TABLE 4

LEGISLATORS RETIREMENT PLAN

SERVICE RETIREMENTS AS OF JUNE 30, 1990

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	3	20	1					24
65-69		7	35					42
70-74		1	15	10				26
75-79			1	5	9			15
80-84				2	7	1		10
85+					6	3		9
TOTAL	3	28	52	17	22	4	0	126

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	5,640	6,384	10,590					6,467
65-69		8,315	8,935					8,832
70-74		15,416	14,132	7,576				11,660
75-79			21,023	10,742	6,557			8,917
80-84				9,363	8,447	4,462		8,232
85+					9,819	5,036		8,225
ALL	5,640	7,190	10,699	8,717	8,048	4,893	0	8,884

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
17	201	556	148	177	20	0	1,119

TABLE 6

LEGISLATORS RETIREMENT PLAN

SURVIVORS AS OF JUNE 30, 1990

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
60-64			1		1			2
65-69		3	1	1	1			6
70-74		2	1	1	3			7
75-79		2		3	3			8
80-84		3			4	2		9
85+		1						1
TOTAL	0	12	4	6	12	3	0	37

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		18,077	0	5,598				7,892
50-54								0
55-59						2,322		2,322
60-64			2,441		4,657			3,549
65-69		2,952	1,421	2,308	4,234			2,803
70-74		6,686	9,219	6,081	3,174			5,456
75-79		1,955		5,997	3,754			4,146
80-84		4,524			2,776	2,854		3,376
85+		5,304						5,304
ALL	0	5,258	3,270	5,330	3,398	2,677	0	4,242

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	63	13	32	41	8	0	157

TABLE 7

LEGISLATORS RETIREMENT PLAN

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1989	201	95	16
B. Additions	4	3	0
C. Deletions:			
1. Service Retirement	0	(3)	0
2. Disability	0	0	0
3. Death	(1)	0	(1)
4. Terminated-Deferred	(2)	-	(2)
5. Terminated-Refund	(1)	(1)	(2)
6. Terminated-Other Non-vested	0	0	-
7. Returned as Active	-	(2)	0
D. Data Adjustments	0	9	(8)
Vested	130		
Non-Vested	71		
E. Total on June 30, 1990	201	101	3

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1989	125	NA	36
B. Additions	3		1
C. Deletions:			
1. Service Retirement	-		-
2. Death	(3)		(1)
3. Annuity Expired	0		0
4. Returned as Active	0		-
D. Data Adjustments	1		1
E. Total on June 30, 1990	126	NA	37

TABLE 8

LEGISLATORS RETIREMENT PLAN

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1990

A. CURRENT ASSETS (TABLE 1, F6)			$12,748
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			16,287
2. Present Value of Future Normal Costs			$10,636
3. Total Expected Future Assets			26,923
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$39,671
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$11,009	$11,009
b. Disability Benefits		0	0
c. Surviving Spouse and Child Benefits		1,652	1,652
2. Deferred Retirements with Future Augmentation		4,843	4,843
3. Former Members without Vested Rights		23	23
4. Active Members			
a. Retirement Annuities	995	10,306	11,301
b. Disability Benefits	0	0	0
c. Survivors' Benefits	513	0	513
d. Deferred Retirements	23	60	83
e. Refund Liability Due to Death or Withdrawal	0	230	230
5. Total Current Benefit Obligations	$1,531	$28,123	$29,654
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$12,304
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$41,958
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$16,906
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			$2,287

TABLE 9

LEGISLATORS RETIREMENT PLAN

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

JULY 1, 1990

	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	$22,962	$9,524	$13,438
b. Disability Benefits	0	0	0
c. Survivors Benefits	1,020	560	460
d. Deferred Retirements	106	78	28
e. Refunds Due to Death or Withdrawal	343	474	(131)
f. Total	$24,431	$10,636	$13,795
2. Deferred Retirements with Future Augmentation	$4,843		$4,843
3. Former Members Without Vested Rights	23		23
4. Annuitants in MPRIF	8,809		8,809
5. Recipients Not in MPRIF	3,852		3,852
6. Total	$41,958	$10,636	$31,322

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$31,322
2. Current Assets (Table 1,F6)	12,748
3. UAAL (B1-B2)	$18,574
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$132,092
2. Supplemental Contribution Rate (B3/C1)	14.06%

TABLE 10

LEGISLATORS RETIREMENT PLAN

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

YEAR ENDING JUNE 30, 1990

A. UAAL AT BEGINNING OF YEAR	$16,504
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$1,133
2. Contribution	(997)
3. Interest on A, B1, and B2	1,409
4. Total (B1+B2+B3)	$1,545
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$18,049
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($64)
2. Investment Return	352
3. MPRIF Mortality	178
4. Mortality of Other Benefit Recipients	86
5. Other Items	(27)
6. Total	$525
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D7)	$18,574
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$18,574

TABLE 11

LEGISLATORS RETIREMENT PLAN

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1990

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 3A		
1. Employee Contributions	9.00%	$579
2. Employer Contributions	21.89%	1,408
3. Total	30.89%	$1,987
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	16.07%	$1,034
b. Disability Benefits	0.00%	0
c. Survivors	0.78%	50
d. Deferred Retirement Benefits	0.22%	14
e. Refunds Due to Death or Withdrawal	0.89%	57
f. Total	17.96%	$1,155
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $18,574	14.06%	$904
3. Allowance for Expenses	0.60%	$39
4. Total	32.62%	$2,098
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-1.73%	($111)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1990 is $5,465 in salaries and $965 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
1990					$3,939
1991	$1,987	$538	$319	$0	5,069
1992	2,082	3,717	222	0	3,212
1993	1,833	994	301	0	3,750
1994	1,939	1,904	297	0	3,488
1995	1,975	1,445	325	0	3,694
1996	2,150	859	350	0	4,634
1997	2,455	2,014	354	0	4,721
1998	2,566	1,368	370	0	5,549
1999	2,711	1,954	386	0	5,920
2000	2,863	2,402	397	0	5,984
2001	3,199	2,568	411	0	6,204
2002	3,397	2,464	426	0	6,711
2003	3,844	1,711	441	0	8,403
2004	4,676	2,579	454	0	10,047
2005	4,991	4,651	458	0	9,929
2006	4,781	3,554	469	0	10,686
2007	4,947	5,298	476	0	9,860
2008	5,485	7,026	472	0	7,847
2009	5,126	3,592	487	0	8,895
2010	5,969	2,177	497	0	12,190
2011	6,661	3,795	497	0	14,559
2012	7,353	9,389	497	0	12,026
2013	7,379	4,227	493	0	14,685
2014	7,972	9,156	500	0	13,001
2015	7,618	5,276	487	0	14,856
2016	8,034	7,255	517	0	15,118
2017	8,398	9,779	495	0	13,242
2018	8,035	6,604	506	0	14,167
2019	8,308	5,982	516	0	15,977
2020	8,938	6,517	516	0	17,883

TABLE 13

LEGISLATORS RETIREMENT PLAN

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8.5% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at January 1 excluding per diem payments increased 3.0% to current fiscal year, 6.0% for the next year, and 6.5% annually for each future year thereafter. 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. (0.60% 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. 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 $4,800 per member. This is based on $48 per day times an average session of 100 days. Statutory employer contributions were assumed to be 85% of the discounted average of transfers to MPRIF for the next 5 fiscal years plus 50% of the other disbursements in the next fiscal year. MPRIF transfers and other disbursements are taken from Table 12.
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.

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.
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.
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.
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.
Form of Payment	Paid as a joint and survivor annuity to Member, spouse, and dependent children.

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 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.

TABLE 14
(cont)

Deferred Annuity Eligibility	Same Service requirement as for Normal Retirement.
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.

JUDGES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1990

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

November 12, 1990

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, 1990 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)

	07/01/89 VALUATION	07/01/90 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 490 % of Payroll	25.49%	22.56%
2. Required Contributions - Chapter 356 % of Payroll	24.30%	23.59%
3. Sufficiency (Deficiency) (A1-A2)	1.19%	-1.03%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$23,352	$28,116
b. Current Benefit Obligations (Table 8)	$64,106	$68,487
c. Funding Ratio (a/b)	36.43%	41.05%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$23,352	$28,116
b. Actuarial Accrued Liability (Table 9)	$64,854	$69,396
c. Funding Ratio (a/b)	36.01%	40.52%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$98,870	$98,016
b. Current and Expected Future Benefit Obligations	$93,774	$102,734
c. Funding Ratio (a/b)	105.43%	95.41%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	257	262
b. Projected Annual Earnings	$18,759	$20,662
c. Average Annual Earnings (Actual $)	$72,992	$78,862
d. Average Age	53.6	52.9
e. Average Service	11.3	10.7
2. Others		
a. Service Retirements (Table 4)	95	105
b. Disability Retirements (Table 5)	8	9
c. Survivors (Table 6)	63	64
d. Deferred Retirements (Table 7)	4	2
e. Terminated Other Non-vested (Table 7)	0	1
f. Total	170	181

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 22.56%. The remaining 1.03% needed to reach the required contribution level of 23.59% will be paid by the State as needed in future years according to chapter 490 of Minnesota Statutes. The section discussing contribution sufficiency describes the process of estimating the statutory employer contributions. There were no changes in plan provisions or actuarial assumptions since the prior valuation.

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 year's ratio is 41.05%. The corresponding ratio for the prior year was 36.43%.

- 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 1990 the ratio is 40.52%, which is an increase from the 1989 value of 36.01%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 95.41% verifies that the current statutory contributions are going to cover only a portion of the plan benefits. 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, 1991 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 1991 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, 1990 is provided below:

MPRIF Reserves	$24,949,000
Reserves Plus Excess Earnings	26,100,000
MPRIF Market Value	27,200,000

The non-MPRIF Reserves amount of $11,171,000 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 are shown in Table 4. 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.

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, 1990 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$36,278,000
Current Employees -	
Accumulated employee contributions including allocated investment income	6,218,000 *
Employer-financed vested	18,232,000
Employer-financed nonvested	7,759,000
Total Pension Benefit Obligation	$68,487,000

* Estimated

The net assets available at market is $27,939,000 (cost value is $28,205,000). The total Pension Benefit Obligation exceeds the assets by $40,548,000 to produce a funded ratio of 40.79%.

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 loss from salaries due to salaries increasing more than the expected increase.

- o A gain from Current Assets because the return was 14.6% instead of the assumed 8.5%.

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.

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 payments are considered employer contributions, they are included in the statutory contributions.

This report estimates the employer contributions 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 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 deficiency since the Statutory Contribution Rate is 22.56% compared to the Required Contribution Rate of 23.59%. As noted earlier, the State will make the necessary contributions to meet benefit payments.

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).

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 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 1992 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 actuarial assumptions are the same as those used in the prior valuation.

Changes in Plan Provisions

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

TABLE 1

JUDGES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1990

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$243	$243
2. Investments		
a. Fixed Income	817	905
b. Equity	2,267	2,458
c. Real Estate	242	229
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	24,949	24,949
4. Other	0	0
B. TOTAL ASSETS	$28,518	$28,784
C. AMOUNTS CURRENTLY PAYABLE	$579	$579
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$4,683	$4,683
2. State Reserves	(12,864)	(12,598)
3. MPRIF Reserves	24,949	24,949
4. Non-MPRIF Reserves	11,171	11,171
5. Total Assets Available for Benefits	$27,939	$28,205
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$28,518	$28,784

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$28,205
2. Market Value (D5)	$27,939	
3. Cost Value (D5)	28,205	
4. Market Over Cost (F2-F3)	($266)	
5. 1/3 of Market Over Cost(F4)/3		(89)
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$28,116

TABLE 2

JUDGES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1990

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$23,405	$23,325
B. OPERATING REVENUES		
1. Member Contributions	$779	$779
2. Employer Contributions	5,500	5,500
3. Investment Income	498	498
4. MPRIF Income	1,806	1,806
5. Net Realized Gain (Loss)	190	190
6. Other	39	39
7. Net Change in Unrealized Gain (Loss)	(346)	0
8. Total Revenue	$8,466	$8,812
C. OPERATING EXPENSES		
1. Service Retirements	$2,926	$2,926
2. Disability Benefits	165	165
3. Survivor Benefits	755	755
4. Refunds	1	1
5. Expenses	63	63
6. Other	22	22
7. Total Disbursements	$3,932	$3,932
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$27,939	$28,205

TABLE 3

JUDGES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1990

	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	4	6	4						14
40-44	7	24	18	1					50
45-49	4	9	22	9	1				45
50-54		14	4	14	14	2	1		49
55-59		4	5	5	7	5			26
60-64	1	6	5	7	16	6	4	3	48
65+		1	5	4	5	5	7	3	30
TOTAL	16	64	63	40	43	18	12	6	262

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	52,370	72,877	72,403						66,882
40-44	70,788	72,601	71,603	72,539					71,987
45-49	64,255	72,418	72,604	72,318	70,296				71,716
50-54		72,461	72,539	72,539	72,985	72,539	72,539		72,644
55-59		72,539	72,539	72,539	72,539	72,539			72,539
60-64	70,316	74,637	74,433	71,604	72,787	72,539	72,539	73,578	72,964
65+		72,539	76,975	77,275	74,433	76,951	72,539	72,823	74,989
ALL	64,521	72,757	72,788	72,799	72,945	73,765	72,539	73,201	72,368

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
1,032	4,656	4,586	2,912	3,137	1,328	870	439	18,960

TABLE 4

JUDGES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1990

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	3	5						8
65-69	6	14	3					23
70-74	4	15	6	2				27
75-79			17	6				23
80-84			2	11	3			16
85+				1	3	4		8
TOTAL	13	34	28	20	6	4	0	105

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	18,318	23,820						21,757
65-69	30,058	23,627	25,612					25,563
70-74	18,361	28,126	37,738	22,788				28,420
75-79			36,610	21,931				32,781
80-84			9,679	29,575	19,208			25,144
85+				21,505	26,537	22,829		24,054
ALL	23,750	25,640	33,750	26,199	22,873	22,829	0	27,410

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
309	872	945	524	137	91	0	2,878

TABLE 5

JUDGES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1990

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

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59		17,883						17,883
60-64					23,655			23,655
65-69		27,894	33,377	18,605				26,625
70-74			30,849					30,849
75-79				18,067				18,067
80-84								0
85+								0
TOTAL	0	22,889	31,481	18,336	23,655	0	0	25,781

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	46	125	37	24	0	0	232

TABLE 6

JUDGES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1990

AGE	YEARS SINCE DEATH ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		4						4
50-54		2						2
55-59								0
60-64	1	2	2	2	1			8
65-69		1	2		1	2		6
70-74		2	2		3			7
75-79	1	2	1	2	2	4	1	13
80-84		1		2	5	2	2	12
85+		1		2	2	4	3	12
TOTAL	2	15	7	8	14	12	6	64

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		15,923						15,923
50-54		15,480						15,480
55-59								0
60-64	24,507	13,197	14,489	8,487	10,294			13,393
65-69		27,867	19,897		9,471	16,129		18,232
70-74		14,116	26,819		10,322			16,119
75-79	16,129	11,315	22,307	11,086	16,129	9,251	7,560	12,312
80-84		16,128		11,263	16,992	16,129	7,308	14,207
85+		16,129		18,111	14,491	13,703	12,472	14,463
ALL	20,318	15,469	20,674	12,236	14,066	13,027	9,932	14,502

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
41	231	145	98	197	156	60	928

TABLE 7

JUDGES RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1989	257	4	0
B. Additions	24	0	1
C. Deletions:			
1. Service Retirement	(16)	0	0
2. Disability	(1)	0	
3. Death	(1)	0	0
4. Terminated-Deferred	0	-	
5. Terminated-Refund	(1)	0	0
6. Terminated-Other Non-vested	0	0	-
7. Returned as Active	-	(1)	0
D. Data Adjustments	0	(1)	0
Vested	182		
Non-Vested	80		
E. Total on June 30, 1990	262	2	1

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1989	95	8	63
B. Additions	16	1	3
C. Deletions:			
1. Service Retirement	-	0	-
2. Death	(4)	0	(4)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	-
D. Data Adjustments	(2)	0	2
E. Total on June 30, 1990	105	9	64

TABLE 8

JUDGES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1990

A. CURRENT ASSETS (TABLE 1, F6)			$28,116
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			36,562
2. Present Value of Future Normal Costs			33,338
3. Total Expected Future Assets			69,900
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$98,016
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$24,737	$24,737
b. Disability Benefits		2,532	2,532
c. Surviving Spouse and Child Benefits		8,851	8,851
2. Deferred Retirements		154	154
3. Former Members without Vested Rights		4	4
4. Active Members			
a. Retirement Annuities	1,363	24,289	25,652
b. Disability Benefits	2,000	0	2,000
c. Survivors' Benefits	4,396	0	4,396
d. Deferred Retirements	0	0	0
e. Refund Liability Due to Death or Withdrawal	0	161	161
5. Total Current Benefit Obligations	$7,759	$60,728	$68,487
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$34,247
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$102,734
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$40,371
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			$4,718

TABLE 9

JUDGES RETIREMENT FUND

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

JULY 1, 1990

	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	$53,290	$24,337	$28,953
b. Disability Benefits	4,172	2,661	1,511
c. Survivors Benefits	8,643	6,139	2,504
d. Deferred Retirements	0	0	0
e. Refunds Due to Death or Withdrawal	351	201	150
f. Total	$66,456	$33,338	$33,118
2. Deferred Retirements	$154		$154
3. Former Members Without Vested Rights	4		4
4. Annuitants in MPRIF	24,949		24,949
5. Recipients Not in MPRIF	11,171		11,171
6. Total	$102,734	$33,338	$69,396

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$69,396
2. Current Assets (Table 1,F6)	28,116
3. UAAL (B1-B2)	$41,280
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$458,742
2. Supplemental Contribution Rate (B3/C1)	9.00%

TABLE 10

JUDGES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1990

A. UAAL AT BEGINNING OF YEAR	$41,502
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$2,640
2. Contribution	(6,279)
3. Interest on A, B1, and B2	3,373
4. Total (B1+B2+B3)	($266)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$41,236
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	$423
2. Investment Return	(239)
3. MPRIF Mortality	496
4. Mortality of Other Benefit Recipients	(474)
5. Other Items	(162)
6. Total	$44
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$41,280
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$41,280

TABLE 11

JUDGES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1990

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 490		
1. Employee Contributions	4.31%	$891
2. Employer Contributions	18.25%	3,771
3. Total	22.56%	$4,662
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	10.34%	$2,135
b. Disability Benefits	1.08%	224
c. Survivors	2.74%	567
d. Deferred Retirement Benefits	0.00%	0
e. Refunds Due to Death or Withdrawal	0.08%	16
f. Total	14.24%	$2,942
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $41,280	9.00%	$1,860
3. Allowance for Expenses	0.35%	$72
4. Total	23.59%	$4,874
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-1.03%	($212)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1990 is $20,662

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
1990					$3,167
1991	$4,662	$801	$1,345	$376	6,059
1992	5,076	5,388	1,251	449	4,945
1993	5,283	5,205	1,178	374	4,219
1994	5,023	2,000	1,111	440	6,571
1995	5,568	3,484	1,045	603	8,213
1996	5,764	3,604	982	748	10,139
1997	6,018	7,968	917	740	8,012
1998	5,179	3,593	859	712	9,451
1999	5,442	5,431	800	770	9,432
2000	5,910	4,374	746	835	11,056
2001	6,552	4,817	693	984	13,083
2002	7,048	2,214	645	1,290	18,562
2003	8,549	5,110	600	1,698	23,099
2004	9,721	9,387	557	1,954	24,831
2005	10,027	8,708	505	2,145	27,790
2006	10,822	7,801	468	2,471	32,813
2007	11,614	11,543	424	2,774	35,234
2008	11,941	12,069	391	2,973	37,688
2009	12,922	10,712	364	3,282	42,816
2010	14,690	13,258	337	3,686	47,597
2011	16,110	11,236	310	4,240	56,401
2012	18,826	12,292	293	5,059	67,701
2013	20,836	18,268	262	5,853	75,859
2014	23,488	21,873	244	6,506	83,736
2015	24,766	21,732	227	7,237	93,781
2016	25,415	28,172	210	7,845	98,658
2017	26,291	21,882	176	8,566	111,458
2018	28,980	34,515	138	9,233	115,018
2019	27,334	26,985	120	9,786	125,034
2020	25,851	20,464	105	10,852	141,168

TABLE 13

JUDGES RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8.5% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at January 1 increased to current fiscal year by one-half of the known 1990 salary increase, 6.0% for the next year, and 6.5% annually for each future year thereafter.
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. (0.35% 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 ($975/month for 1990), increasing with salary scale. Covered annual wages: $51,300 Contribution rate: 7.65% for 1990 and later.

Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	Statutory employer contributions were assumed to be 85% of the 5-year discounted average of MPRIF transfers plus 100% of other disbursements for the next fiscal year. MPRIF transfers and other disbursements are found in Table 12.
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

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.

TABLE 14
BASIC
(Cont)

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.

TABLE 14
COORDINATED

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.

TABLE 14
COORDINATED
(cont)

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.

STATE PATROL RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1990

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

November 19, 1990

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, 1990 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

STATE PATROL RETIREMENT FUND

TABLE OF CONTENTS

STATE PATROL RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/89 VALUATION	07/01/90 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352B % of Payroll	27.40%	23.38%
2. Required Contributions - Chapter 356 % of Payroll	21.84%	22.15%
3. Sufficiency (Deficiency) (A1-A2)	5.56%	1.23%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$167,271	$185,699
b. Current Benefit Obligations (Table 8)	$184,250	$198,359
c. Funding Ratio (a/b)	90.78%	93.62%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$167,271	$185,699
b. Actuarial Accrued Liability (Table 9)	$194,434	$207,343
c. Funding Ratio (a/b)	86.03%	89.56%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$304,877	$293,670
b. Current and Expected Future Benefit Obligations	$263,684	$284,284
c. Funding Ratio (a/b)	115.62%	103.30%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	765	788
b. Projected Annual Earnings	$32,591	$34,423
c. Average Annual Earnings (Actual $)	$42,603	$43,684
d. Average Age	40.7	40.6
e. Average Service	14.0	13.8
2. Others		
a. Service Retirements (Table 4)	340	346
b. Disability Retirements (Table 5)	14	14
c. Survivors (Table 6)	101	105
d. Deferred Retirements (Table 7)	19	23
e. Terminated Other Non-vested (Table 7)	7	4
f. Total	481	492

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 decreased from 5.56% in 1989 to 1.23% in 1990. The decrease in sufficiency is primarily the result of the 4.02 percentage point reduction in the statutory employer contribution rate from 18.90% of payroll last year to 14.88% of payroll this year. According to this valuation a contribution rate of 22.15% is required to comply with Minnesota Law.

All actuarial assumptions and all plan provisions, other than the change in the statutory employer contribution rate are the same as in the prior valuation.

The financial status of the Fund 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 year's ratio is 93.62%. The corresponding ratio for the prior year was 90.78%.

- 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 1990 the ratio is 89.56%, which is an increase from the 1989 value of 86.03%.

- 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, 1991 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 1991 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, 1990 is provided below:

MPRIF Reserves	$84,931,000
Reserves Plus Excess Earnings	88,900,000
MPRIF Market Value	92,500,000

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. 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, 1990 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$95,947,000
Current Employees -	
Accumulated employee contributions including allocated investment income	32,468,000 *
Employer-financed vested	54,297,000
Employer-financed nonvested	15,647,000
Total Pension Benefit Obligation	$198,359,000

* Estimated

The net assets available for benefits at cost is $182,966,000. The total Pension Benefit Obligation exceeds the assets by $15,393,000 to produce a funded ratio of 92.24%

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 5.6% compared to the expected 6.5%.

- A gain from Current Assets because the return was 12.6% instead of the assumed 8.5%.

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 23.38% compared to the Required Contribution Rate of 22.15%.

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 1992 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 was a change in plan provisions since the prior valuation. The statutory employer contribution rate was decreased from 18.50% of payroll to 14.88% of payroll.

Changes in Actuarial Assumptions

The actuarial assumptions are the same as those used in the prior valuation.

TABLE 1

STATE PATROL RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1990

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$1,433	$1,433
2. Investments		
a. Fixed Income	27,318	27,611
b. Equity	69,492	62,438
c. Real Estate	7,725	6,288
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	84,931	84,931
4. Other	343	343
B. TOTAL ASSETS	$191,242	$183,044
C. AMOUNTS CURRENTLY PAYABLE	$78	$78
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$21,276	$21,276
2. State Reserves	76,094	67,896
3. MPRIF Reserves	84,931	84,931
4. Non-MPRIF Reserves	8,863	8,863
5. Total Assets Available for Benefits	$191,164	$182,966
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$191,242	$183,044
F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		$182,966
2. Market Value (D5)	$191,164	
3. Cost Value (D5)	182,966	
4. Market Over Cost (F2-F3)	$8,198	
5. 1/3 of Market Over Cost(F4)/3		2,733
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$185,699

TABLE 2

STATE PATROL RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1990

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$173,744	$164,034
B. OPERATING REVENUES		
1. Member Contributions	$2,568	$2,568
2. Employer Contributions	5,706	5,706
3. Investment Income	9,517	9,517
4. MPRIF Income	7,008	7,008
5. Net Realized Gain (Loss)	2,345	2,345
6. Other (Includes State Appropriation)	2	2
7. Net Change in Unrealized Gain (Loss)	(1,512)	0
8. Total Revenue	$25,634	$27,146
C. OPERATING EXPENSES		
1. Service Retirements	$7,627	$7,627
2. Disability Benefits	206	206
3. Survivor Benefits	13	13
4. Refunds	27	27
5. Expenses	240	240
6. Other	101	101
7. Total Disbursements	$8,214	$8,214
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$191,164	$182,966

TABLE 3

STATE PATROL RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1990

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	11	5							16
25-29	16	56	21						93
30-34	14	25	59	31					129
35-39	2	20	33	65	15				135
40-44	3	3	13	33	68	27			147
45-49	1	2	2	10	30	93	5		143
50-54	1			2	7	42	39		91
55-59						2	11	7	20
60-64				1	1	3	5	2	12
65+							2		2
TOTAL	48	111	128	142	121	167	62	9	788

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	25,063	29,583							26,475
25-29	24,032	32,095	34,846						31,329
30-34	25,462	32,944	36,588	39,439					35,359
35-39	29,992	33,760	38,416	39,110	43,710				38,524
40-44	34,030	38,107	37,076	41,250	41,527	40,383			40,638
45-49	33,556	36,437	36,790	41,979	42,799	39,927	39,509		40,521
50-54	33,713			39,679	44,707	41,182	39,659		40,685
55-59						39,978	42,158	45,114	42,974
60-64				38,428	39,321	42,567	38,073	45,168	40,513
65+							36,839		36,839
ALL	25,959	32,714	36,826	39,885	42,279	40,365	39,871	45,126	38,058

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
1,246	3,631	4,714	5,663	5,116	6,741	2,472	406	29,989

TABLE 4

STATE PATROL RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	1							1
55-59	12	51						63
60-64	4	37	63					104
65-69	2	3	50	29				84
70-74	1	1	16	20	15			53
75-79				3	11	7		21
80-84						7	10	17
85+					2		1	3
TOTAL	20	92	129	52	28	14	11	346

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	15,477							15,477
55-59	24,411	20,756						21,452
60-64	27,055	23,042	20,506					21,660
65-69	12,958	21,282	22,976	15,827				20,209
70-74	16,329	23,891	15,331	18,757	10,052			15,310
75-79				27,479	14,797	7,081		14,037
80-84						8,955	7,178	7,909
85+					15,528		8,034	13,030
ALL	22,944	21,727	20,822	17,626	12,308	8,018	7,255	19,066

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
459	1,999	2,685	917	345	112	80	6,597

TABLE 5

STATE PATROL RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		1	1					2
50-54	1			1				2
55-59			1	2				3
60-64				3	1			4
65-69				1	2			3
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	1	1	2	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		5,815	16,825					11,320
50-54	21,423			10,531				15,977
55-59			23,337	13,905				17,049
60-64				15,695	9,502			14,147
65-69				18,082	9,395			12,290
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	21,423	5,815	20,081	14,787	9,430	0	0	14,228

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
21	6	40	104	28	0	0	199

TABLE 6

STATE PATROL RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1990

	YEARS SINCE DEATH							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		1		1				2
50-54	1	1						2
55-59			3	2	1	1		7
60-64	1	3	3	2	1	1		11
65-69		3	5	6	1			15
70-74	2	2	4	2	4		3	17
75-79	3	9	2	2	2	1	1	20
80-84	1	3	4	1	2	1	5	17
85+			5	2	1		6	14
TOTAL	8	22	26	18	12	4	15	105

AVERAGE ANNUAL BENEFIT

	YEARS SINCE DEATH							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		6,173		4,802				5,488
50-54	5,168	7,333						6,251
55-59			18,420	8,622	4,306	3,902		11,530
60-64	4,461	18,414	17,093	13,118	13,966	5,919		14,282
65-69		17,122	15,964	10,328	4,827			13,198
70-74	8,673	6,009	5,984	7,657	7,487		3,998	6,503
75-79	6,839	5,026	5,568	7,780	7,825	7,655	4,016	5,989
80-84	5,907	4,438	4,853	5,004	6,097	4,047	4,040	4,710
85+			3,930	4,077	4,052		4,226	4,086
ALL	6,675	8,667	10,019	8,571	7,079	5,381	4,104	7,875

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
53	191	260	154	85	22	62	827

STATE PATROL RETIREMENT FUND

RECONCILIATION OF MEMBERS

		TERMINATED	
	ACTIVES	DEFERRED RETIREMENT	OTHER NON-VESTED
A. On June 30, 1989	765	19	7
B. Additions	51	5	2
C. Deletions:			
1. Service Retirement	(19)	(1)	0
2. Disability	(1)	0	0
3. Death	(1)	0	0
4. Terminated-Deferred	(5)	-	0
5. Terminated-Refund	(1)	0	0
6. Terminated-Other Non-vested	0	0	-
7. Returned as Active	-	0	0
D. Data Adjustments	(1)	0	(5)
Vested	629		
Non-Vested	159		
E. Total on June 30, 1990	788	23	4

	RECIPIENTS		
	RETIREMENT ANNUITANTS	DISABLED	SURVIVORS
A. On June 30, 1989	340	14	101
B. Additions	20	1	11
C. Deletions:			
1. Service Retirement	-	0	-
2. Death	(14)	(1)	(6)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	-
D. Data Adjustments	0	0	(1)
E. Total on June 30, 1990	346	14	105

TABLE 8

STATE PATROL RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1990

	Non-Vested	Vested	Total
A. CURRENT ASSETS (TABLE 1, F6)			$185,699
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			31,030
2. Present Value of Future Normal Costs			76,941
3. Total Expected Future Assets			107,971
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$293,670
D. CURRENT BENEFIT OBLIGATIONS			
1. Benefit Recipients			
a. Retirement Annuities		$78,415	$78,415
b. Disability Benefits		2,416	2,416
c. Surviving Spouse and Child Benefits		12,963	12,963
2. Deferred Retirements with Future Augmentation		2,096	2,096
3. Former Members without Vested Rights		57	57
4. Active Members			
a. Retirement Annuities	444	77,560	78,004
b. Disability Benefits	8,561	0	8,561
c. Survivors' Benefits	6,543	0	6,543
d. Deferred Retirements	99	9,091	9,190
e. Refund Liability Due to Death or Withdrawal	0	114	114
5. Total Current Benefit Obligations	$15,647	$182,712	$198,359
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$85,925
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$284,284
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$12,660
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($9,386)

TABLE 9

STATE PATROL RETIREMENT FUND

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

JULY 1, 1990

	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	$146,408	$53,359	$93,049
b. Disability Benefits	14,835	7,579	7,256
c. Survivors Benefits	11,186	7,254	3,932
d. Deferred Retirements	15,713	8,432	7,281
e. Refunds Due to Death or Withdrawal	195	317	(122)
f. Total	$188,337	$76,941	$111,396
2. Deferred Retirements with Future Augmentation	$2,096		$2,096
3. Former Members Without Vested Rights	57		57
4. Annuitants in MPRIF	84,931		84,931
5. Recipients Not in MPRIF	8,863		8,863
6. Total	$284,284	$76,941	$207,343

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$207,343
2. Current Assets (Table 1,F6)	185,699
3. UAAL (B1-B2)	$21,644
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020	$764,280
2. Supplemental Contribution Rate (B3/C1)	2.83%

TABLE 10

STATE PATROL RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1990

A. UAAL AT BEGINNING OF YEAR	$27,163
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$5,492
2. Contribution	(8,274)
3. Interest on A, B1, and B2	2,191
4. Total (B1+B2+B3)	($591)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$26,572
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($2,777)
2. Investment Return	(3,717)
3. MPRIF Mortality	(87)
4. Mortality of Other Benefit Recipients	34
5. Other Items	1,619
6. Total	($4,928)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$21,644
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$21,644

TABLE 11

STATE PATROL RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1990

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352B		
1. Employee Contributions	8.50%	$2,926
2. Employer Contributions	14.88%	5,122
3. Total	23.38%	$8,048
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	12.84%	$4,415
b. Disability Benefits	1.84%	635
c. Survivors	1.78%	614
d. Deferred Retirement Benefits	2.00%	689
e. Refunds Due to Death or Withdrawal	0.07%	25
f. Total	18.53%	$6,378
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of $21,644	2.83%	$974
3. Allowance for Expenses	0.79%	$272
4. Total	22.15%	$7,624
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	1.23%	$424

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1990 is $34,423

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
1990					$100,768
1991	$8,048	$1,202	$819	$8,821	115,616
1992	8,571	8,648	914	9,785	124,410
1993	9,128	3,032	1,012	10,791	140,285
1994	9,722	6,879	1,105	11,998	154,021
1995	10,354	7,462	1,196	13,164	168,881
1996	11,027	8,453	1,288	14,410	184,577
1997	11,743	11,865	1,394	15,625	198,686
1998	12,507	13,008	1,483	16,804	213,506
1999	13,320	15,240	1,554	18,000	228,032
2000	14,185	11,954	1,626	19,408	248,045
2001	15,108	19,535	1,691	20,824	262,751
2002	16,090	23,893	1,764	21,927	275,111
2003	17,135	24,211	1,831	23,006	289,210
2004	18,249	26,413	1,886	24,156	303,316
2005	19,435	22,098	1,948	25,586	324,291
2006	20,699	24,456	2,037	27,318	345,815
2007	22,044	30,078	2,122	28,963	364,622
2008	23,477	27,565	2,207	30,725	389,052
2009	25,003	20,331	2,302	33,170	424,592
2010	26,628	26,252	2,409	36,004	458,563
2011	28,359	31,752	2,508	38,727	491,389
2012	30,202	32,256	2,626	41,569	528,278
2013	32,165	34,264	2,744	44,698	568,133
2014	34,256	39,686	2,895	47,937	607,745
2015	36,483	39,236	3,039	51,412	653,365
2016	38,854	46,027	3,171	55,096	698,117
2017	41,380	37,275	3,365	59,371	758,228
2018	44,069	46,333	3,564	64,202	816,602
2019	46,934	55,338	3,832	68,891	873,257
2020	49,985	44,717	4,000	74,281	948,806

TABLE 13

STATE PATROL RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8.5% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at January 1 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. (0.79% 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. Each member is assumed to have two children whose ages are dependent upon the members 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:	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

	Death		Withdrawal		Disability		Retirement	
Age	Male	Female	Male	Female	Male	Female	Male	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		Withdrawal		Disability		Retirement	
	Male	Female	Male	Female	Male	Female	Male	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

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	14.88% of Salary.(Amended 1990).
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.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 55 and 3 years of Allowable Service.
Amount	2.5% of Average Salary for each year of Allowable Service.
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.
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.

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.

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.

Non-Duty Disability Benefit

Eligibility	Under age 55 with at least 1 year of Allowable Service and disability not related to covered employment.
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 15 years) and Average Salary at disability without reduction for commencement before age 55.

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.
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. 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.
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.

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.
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.
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.
Deferred Benefit	
Eligibility	3 years of Allowable Service.
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.