

***MINNESOTA STATE
RETIREMENT SYSTEM***

Actuarial Valuations
as of
JUNE 30, 1986

STATE EMPLOYEES RETIREMENT FUND

STATE PATROL RETIREMENT FUND

JUDGES RETIREMENT FUND

LEGISLATORS RETIREMENT PLAN

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

ACTUARIAL VALUATION AS OF

JUNE 30, 1986

Board of Directors
Minnesota State Retirement System
529 Jackson at 10th Street
St. Paul, Minnesota

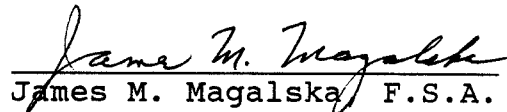
Ladies and Gentlemen:

We have performed an actuarial valuation of the Minnesota State Retirement System, State Employees' Retirement Fund as of June 30, 1986.

The valuation was performed on the basis of accepted actuarial methods and procedures, in accordance with the applicable provisions set forth in Minnesota Statutes (Chapter 356) and stipulated in the Contract between the State of Minnesota and Touche Ross & Co.

We hereby certify that on the basis of our valuation, contributions required from employees and the State under Minnesota Statutes (Chapter 352) represent 105.3% of the requirements set forth in Chapter 356. Furthermore, we certify that the entry age normal cost method was utilized in determining the accrued liability for all benefits payable under the Fund, and the valuation was completed in accordance with the rules adopted by the Legislative Commission on Pensions and Retirement, with the exception of the rule requiring a cash flow projection.

TOUCHE ROSS & CO.


James M. Magalska, F.S.A.


James F. Verlantz, F.S.A.

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REPORT HIGHLIGHTS

Comparison with Previous Valuation

	<u>6/30/85</u>	<u>6/30/86</u>
A. Financial and Actuarial Status		
1. Valuation Assets	\$1,158,383,330	\$1,370,049,308
2. Accrued Liability	1,518,939,395	1,738,897,095
3. Unfunded Accrued Liability (A2 - A1)	360,556,065	368,847,787
4. Accrued Liability Funding Ratio (A1/A2)	76.26%	78.79%
5. Normal Cost		
General Plan	\$62,719,753	\$61,654,808
	(6.11%)*	(5.43%)*
Correctional Plan	2,931,378	3,113,050
	(9.43%)*	(9.28%)*
B. Contributions		
1. Chapter 356 Requirement	86,250,460	86,595,784
2. Actual Prescribed Contribution (Chapter 352)	82,575,178	91,214,999
3. Sufficiency (B2/B1)	.957	1.053
C. Depth of Funding - Plan Contin- uation Basis		
1. Present Value of Accrued Benefits	\$1,235,489,884	\$1,372,758,271
2. Depth of Funding (A1/C1)	93.76%	99.80%

* Parentheses indicate contribution levels as a percentage of salary for all participants.

REPORT HIGHLIGHTS (continued)

	<u>6/30/85</u>	<u>6/30/86</u>
D. Plan Participants		
1. Active Members		
a. Number	45,597	46,390
b. Payroll of employees under assumed retirement age	\$1,057,928,600	\$1,146,844,019
c. Total payroll	1,079,714,997	1,169,240,234
2. Retired Members/Beneficiaries		
a. Number	11,696	12,195
b. Average annual benefit payable	\$3,728	\$4,145
3. Deferred Annuitants		
a. Number	930	990
b. Average annual vested benefit	\$4,103	4,180
4. Former Members Without Vested Rights		
a. Number	4,960	4,484
b. Average employee contributions	\$417	\$445

REPORT HIGHLIGHTS

Results Shown Separately for General and Correctional Employees

	<u>General</u>	<u>Correctional</u>
A. Financial and Actuarial Status		
1. Valuation Assets	\$1,312,576,988	\$ 57,472,320
2. Accrued Liability	1,680,837,004	58,060,091
3. Unfunded Accrued Liability (A2 - A1)	368,260,016	587,771
4. Accrued Liability Funding Ratio (A1/A2)	78.09%	98.99%
5. Normal Cost*	61,654,808 (5.43%)	3,113,050 (9.28%)
B. Contributions		
1. Chapter 356 Requirement	\$83,362,440 (7.34%)	\$3,233,344 (9.64%)
2. Prescribed Contribution (Chapter 352)	86,654,399 (7.63%)	4,560,600 (13.60%)
3. Sufficiency (2 / 1)	1.039	1.410
C. Depth of Funding - Plan Continuation Basis		
1. Present Value of Accrued Benefits	\$1,322,914,689	\$49,843,582
2. Depth of Funding (A1/C1)	99.22%	115.31%

* Parentheses indicate contribution levels as a percentage of salary for all participants.

REPORT HIGHLIGHTS (continued)

	<u>General</u>	<u>Correctional</u>
D. Plan Participants		
1. Active Members		
a. Number	45,171	1,219
b. Valuation payroll of employees under assumed retirement age	\$1,113,310,197	\$33,533,822
c. Total valuation payroll	1,135,706,412	33,533,822
2. Retired Members/Beneficiaries		
a. Number	11,867	328
b. Average annual benefit payable	\$4,069	\$6,908
3. Deferred Annuitants		
a. Number	955	35
b. Average annual vested benefit	\$4,029	\$8,285
4. Former Members Without Vested Rights		
a. Number	4,401	83
b. Average employee contributions	\$413	\$2,099

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

ACTUARIAL VALUATION AS OF JUNE 30, 1986

PURPOSE AND SUMMARY

The purpose of this report is to set forth the financial status of the Minnesota State Retirement System (MSRS), State Employees' Retirement Fund in accordance with the applicable provisions set forth in Chapter 356 and Chapter 11A of the Minnesota Statutes.

Chapter 356 of the Minnesota Statutes sets forth the annual reporting requirements which govern the public employee retirement systems in Minnesota. The principal requirement (in addition to the experience study required every fourth year) is that an actuarial valuation be performed each year and that the valuation specifically set forth the following items based on an assumed 8% pre-retirement and 5% post-retirement interest rate, and a 6-1/2% salary scale assumption:

1. The assets of the plan and the present value of all benefits which will be payable from the plan.
2. The normal cost of the plan (as a level percentage of payroll) based on the entry age normal cost method.
3. The accrued liability of the plan, defined as the present value of all benefits less the present value of future entry age normal costs.
4. An actuarial balance sheet showing accrued assets, accrued liabilities, and the deficit from full funding of the accrued liability (unfunded accrued liability).
5. The annual contribution required to pay normal cost and amortize the June 30, 1986 unfunded accrued liability by June 30, 2010, the full funding date established in the June 30, 1982 valuation.
6. An analysis explaining the increase or decrease in the unfunded accrued liability since the last valuation.

Chapter 11A of the Minnesota Statutes pertains to the operation of the Minnesota Post Retirement Investment Fund (MPRI Fund). It includes requirements regarding the determination of the present value of benefits payable from the MPRI Fund (as of June

30, 1986 and as of January 1, 1987) and the corresponding mortality gain or loss each year, the latter to facilitate an appropriate transfer between the State Employees' Retirement Fund and the MPRI Fund.

This reporting on the status of the State Employees' Retirement Fund as of June 30, 1986, is intended to comply with all of the requirements regarding actuarial reporting that are set forth in Chapters 356 and 11A of the Statutes. Appendix 1 at the end of the report cross-references the information of the Minnesota Statutes set forth herein with that specifically called for under Chapters 356 and 11A respectively.

VALUATION ASSETS

The Executive Director furnished us with a Financial Report setting forth the assets and liabilities of the Fund as of June 30, 1986. The accounting balance sheet furnished by the Executive Director is set forth in Table 1(a).

In order to determine the Chapter 356 contribution requirements, as well as the unfunded accrued liability and depth of funding ratio, separately for Correctional and General Employees, we must allocate the State Contribution Reserve (item B.4 in Table 1(a)) between the General and Correctional Employees' portions of the Fund. The method used in last year's report has been retained and may be briefly outlined as follows:

1. Start with last year's resulting allocation.
2. Add estimated State contributions to each plan, determined by allocating the actual State contribution for the year in proportion to the respective amounts derived by applying the State contribution rates to average General and Correctional payrolls during the year.
3. Deduct any refund of contributions and transfers of assets to the MPRI Fund (estimated, based on new retirees during the year reported at the end of the year). Note that this step is performed only in regard to those items which we can definitely allocate on the valuation date. Determine new 1986 base before allocation of investment earnings.
4. Allocate investment earnings, net of operating expenses, in proportion to the new base.

The June 30, 1986 allocation on this basis results in valuation assets as follows:

General Plan	\$1,312,576,988
Correctional Plan	<u>57,472,320</u>
Total	\$1,370,049,308

ACTUARIAL BALANCE SHEETS

Table 2 sets forth an actuarial balance sheet summarizing the actuarial valuation. Whereas the previously mentioned accounting balance sheet [Table 1(a)] balances the current assets to date with current accumulated reserves for benefits payable, the actuarial balance sheet compares total assets, including the present value of all future contributions payable to the Fund, with the present value of all benefits payable from the Fund.

Table 3(a) sets forth a balance sheet comparing the assets and unfunded accrued liability (the total of the two equaling the accrued liability) to the current liabilities and reserves required under the plan. This table is in the format specifically required by Chapter 356 and is supported by attachments in the form of Tables 3(b) and 3(c), which set forth the determination of the unfunded accrued liability and the status of the MPRI Fund as of June 30, 1986. The status of the MPRI fund as of June 30, 1986 was provided by The Wyatt Company, in their role as actuary for the Legislative Commission on Pensions and Retirement.

Table 1(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Accounting Balance Sheet as of June 30, 1986

A. ASSETS

1. Cash		\$	13,875
2. Short term investments (at cost)			38,435,014
3. Accounts receivable:			
a. Accrued employee contributions	\$1,991,132		
b. Accrued employer contributions	1,954,497		
c. Other	<u>209</u>		3,945,838
4. Due from other plans			162,119
5. Due from other funds			54,787
6. Interest receivable			209,989
7. Investment in debt securities (actuarial value)****			226,222,751
8. Investment in equities (actuarial value)*			604,011,160
9. Equipment at depreciated cost			74,768
10. Participation in MPRI Fund**			<u>497,345,000</u>
11. TOTAL ASSETS			<u>\$1,370,475,301</u>

B. LIABILITIES

Liabilities

1. Accounts payable			
a. Annuitants	\$	4,313	
b. Accrued expenses		269,065	
c. Due MPRI Fund		66,231	
d. Due to other funds		<u>86,384</u>	
2. Total liabilities			\$ <u>425,993</u>

Reserves

1. Participation in MPRI Fund**	497,345,000
2. Survivor benefit reserve	0
3. Employee contribution reserve	248,006,034
4. State contribution reserve	<u>624,698,274</u>
5. Total reserves	\$1,370,049,308
6. TOTAL LIABILITIES AND RESERVES	<u>\$1,370,475,301</u>

* Market value as of June 30, 1986 is \$706,732,825 for equities.

** Participation equals Required Reserves for retired lives.

*** Portion of assets to be applied towards providing benefits.

**** The value at cost as of June 30, 1986 is \$225,928,580 for debt securities.

Table 1(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Allocation of June 30, 1986 Valuation Assets
Between General and Correctional Employees

	<u>General Plan</u>	<u>Correctional Plan</u>	<u>Total</u>
1. Original Base, Equal to the Employee and State Contribution Fund, as Allocated on June 30, 1985	\$704,606,911	\$ 28,978,034	\$733,584,945
2. Allocated Contributions During the Year	75,044,978	3,876,333	78,921,311
3. Transfers of Assets to MPRI Fund During the Year	67,022,000	1,513,000	68,535,000
4. Refunds Allocable During the Year	7,495,879	228,452	7,724,331
5. Estimated Base as of June 30, 1986, Before Allocation of Investment Earnings and Expenses (1) + (2) - (3) - (4)	705,134,010	31,112,915	736,246,925
6. Employee Contribution Reserve as of June 30, 1986	239,439,380	8,566,654	248,006,034
7. Estimated State Contribution Reserve as of June 30, 1986 (5) - (6)	465,694,630	22,546,261	488,240,891
8. Actual State Contribution Reserve, Including Investment Earnings During the Year and Expenses Allocated According to Item 7	595,850,608	28,847,666	624,698,274
9. MPRI Fund Reserve	477,287,000	20,058,000	497,345,000
10. Survivor Benefit Reserve	0	0	0
11. Total Valuation Assets* (6) + (8) + (9) + (10)	1,312,576,988	57,472,320	1,370,049,308

* Includes Employee and State Contribution Reserves, MPRI Fund Participation and Survivor Benefit Reserve.

Table 2

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Actuarial Balance Sheet as of June 30, 1986

A. ASSETS

1. Assets on hand from accounting balance sheet:		
a. Reserves for MPRI Fund benefits	\$497,345,000	
b. All other assets	<u>873,130,301</u>	\$1,370,475,301
2. Present value of employees' future contributions		415,216,983
3. Present value of state future contributions applicable to:		
a. Entry age normal costs	190,478,663	
b. Statutory supplemental contribution	<u>477,885,367</u>	<u>668,364,030</u>
4. TOTAL ASSETS		<u>\$2,454,056,314</u>

B. LIABILITIES

1. Current liabilities from accounting balance sheet		\$ 425,993
2. Present value of earned and earnable benefits payable to presently active members:		
a. Current Benefit Obligations	\$850,551,892	
b. Future Benefit Obligations	<u>971,834,470</u>	\$1,822,386,362
3. Present value of benefits for deferred annuitants		22,794,747
4. Present value of refundment to former members without vested rights		1,993,939
5. Additional liability due to July 1st retirees		72,693
6. Participation in MPRI Fund		<u>497,345,000</u>
7. TOTAL LIABILITIES		<u>\$2,345,018,734</u>

C. PROJECTED BENEFIT FUNDING RATIO (A / B) 104.6%

Table 3(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Chapter 356 Balance Sheet as of June 30, 1986

ASSETS AND UNFUNDED ACCRUED LIABILITIES

A. ASSETS*

1. Cash		\$ 13,875
2. Short term investments (at cost)		38,435,014
3. Accounts receivable:		
a. Accrued employee contributions	\$1,991,132	
b. Accrued employer contributions	1,954,497	
c. Other	<u>209</u>	3,945,838
4. Due from other plans		162,119
5. Due from other funds		54,787
6. Interest receivable		209,989
7. Investment in debt securities (actuarial value)		226,222,751
8. Investment in equities (actuarial value)		604,011,160
9. Equipment at depreciated cost		74,768
10. Participation in MPRI Fund**		<u>497,345,000</u>
11. TOTAL ASSETS		<u>\$1,370,475,301</u>

B. UNFUNDED ACCRUED LIABILITIES

1. Total unfunded accrued liability	<u>368,847,787</u>
2. TOTAL ASSETS AND UNFUNDED ACCRUED LIABILITIES	<u>\$1,739,323,088</u>

(continued)

Table 3(a) (continued)

CURRENT LIABILITIES AND RESERVES REQUIRED

C. LIABILITIES

1. Accounts payable:		
a. Annuity payments	\$	4,313
b. Accrued expenses		269,065
c. Due MPRI Fund		66,231
d. Due to other funds		<u>86,384</u>
2. Total liabilities	\$	<u>425,993</u>

D. RESERVES REQUIRED

1. Total reserves required per attached Table 3(b)	<u>1,738,897,095</u>
2. TOTAL CURRENT LIABILITIES AND RESERVES REQUIRED	<u>\$1,739,323,088</u>

* Accumulated contributions of members not yet retired amounted to \$248,006,034 as of June 30, 1986 (includes accrued but unpaid contributions).

** Participation equals Required Reserves for retired lives as of June 30, 1986, excluding the January 1, 1987 benefit increases.

Table 3(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Determination of Accrued Liability and
Unfunded Accrued Liability as of June 30, 1986

	(1) Present Value of Benefits	(2) Present Value of Applicable Portion of Normal Cost Contribution	(3) Accrued Liability Equals Reserves Required (1) - (2)
A. DETERMINATION OF ACCRUED LIABILITY			
1. Active Members			
a. Retirement benefits	\$1,318,447,450	\$363,098,810	\$ 955,348,640
b. Disability benefits	91,427,354	29,206,556	62,220,798
c. Refundments due to death or withdrawal	174,689,887	135,754,229	38,935,658
d. Surviving spouse benefits	99,343,010	30,181,755	69,161,255
e. Deferred retirement benefits	138,478,661	47,454,296	91,024,365
f. Subtotal	<u>\$1,822,386,362</u>	<u>\$605,695,646</u>	<u>\$1,216,690,716</u>
2. Deferred annuitants	\$ 22,794,747		\$ 22,794,747
3. Former members without vested rights	1,993,939		1,993,939
4. Additional liability due to July 1 retirees	72,693		72,693
5. Participation in MPRI Fund	<u>497,345,000</u>		<u>\$ 497,345,000</u>
6. TOTAL	<u>\$2,344,592,741</u>	<u>\$605,695,646</u>	<u>\$1,738,897,095</u>
B. DETERMINATION OF UNFUNDED ACCRUED LIABILITY			
1. Accrued Liability			1,738,897,095
2. Valuation Assets			1,370,049,308
3. Unfunded Accrued Liability (1 - 2)			368,847,787

MINNESOTA POST RETIREMENT INVESTMENT FUND

Background

The Minnesota Post Retirement Investment Fund (MPRI Fund), previously termed the Minnesota Adjustable Fixed Benefit Fund (MAFB), is basically a vehicle for providing variable annuity payments to pensioners. When an active participant retires, assets equal to the present value of future benefits payable to that participant (and beneficiary, if applicable) are transferred from the State and Employee Contribution Reserves, to the MPRI Fund. Thereafter, benefits are paid from the MPRI Fund. Future benefit increases are determined on the basis of the investment performance of MPRI Fund assets.

Chapter 11A of the Minnesota Statutes provides a method for determining benefit increases. A benefit increase is granted in any year in which the earnings of MPRI Fund assets exceed 5%. In a year in which there is an MPRI Fund deficit (i.e., required reserves exceed MPRI Fund assets) 5% of any income in excess of the 5% requirement is credited towards amortizing the deficit, with the remaining 95% being used to provide benefit increases. If there is no MPRI Fund deficit, all income in excess of the required 5% is used to provide benefit increases.

MPRI Fund Status as of June 30, 1986

Table 3(c) sets forth the determination of MPRI Fund net assets and reserve requirements as of June 30, 1986.

This information was developed by The Wyatt Company, actuaries for the Legislative Commission on Pensions and Retirement, and is reprinted here without verification.

Unfunded Accrued Liability

Tables 4 and 5 reconcile the change in the unfunded accrued liability during the year. Table 4 sets forth a demonstration that the decrease in the unfunded accrued liability is equal to the excess of income over deductions during the year, where any increase in required actuarial reserves is indicated as a deduction item. Table 5 sets forth our analysis of the change in the unfunded accrued liability.

Table 3(c)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Actuarial Information for
Determining MPRI Fund Benefit Increase

	Amount on <u>6/30/86</u>
1. Expected Reserves Assuming 5% Interest (MPRIF Participation Before Actuarial Gain or Loss)	\$497,283,435*
2. Required Reserves (MPRIF Participation After Actuarial Gain or Loss)	497,345,000**
3. Actuarial Gain (Loss) due to Mortality (1) - (2)	(61,565)

Required Reserves (line 2) Valued 1/1/87**

Members Eligible for Increase	\$447,427,000
Members Not Eligible for Increase	<u>42,844,000</u>
Total	\$490,271,000

* Information supplied by State Board of Investment.

** This information was supplied by The Wyatt Company, actuaries for the Legislative Commission on Pensions and Retirement.

Table 4

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Analysis of Income and Deductions from Income
and Effect on the Unfunded Accrued Liability

A. INCOME

1. Contributions from employees		\$ 38,356,191
2. Contributions from employers		40,565,120
3. General fund appropriation		1,295,732
4. From investments		
a. Investment income	\$99,485,921	
b. Unrealized gains	30,525,911	
c. Realized gain on investment	9,938,836	
d. Investment fees	<u>(1,373,516)</u>	138,577,152
5. From MPRI Fund participation		52,302,900
6. Other revenues		<u>3,723</u>
7. TOTAL INCOME		<u>\$271,100,818</u>

B. DEDUCTIONS FROM INCOME

1. Benefits		
a. Service retirement and disability annuities	\$49,431,990	
b. Survivor benefits (spouse)	<u>0</u>	49,431,990
2. Refundments (employee contributions)		
a. Refunds	6,756,191	
b. Interest on refundments	<u>968,140</u>	7,724,331
3. Administrative expenses		1,356,916
4. Increase in total reserves required		
a. Reserves required 6/30/85	\$1,518,939,395	
b. Reserves required 6/30/86	<u>1,738,897,095</u>	<u>219,957,700</u>
5. TOTAL DEDUCTIONS FROM INCOME		<u>\$278,470,937</u>

Table 4 (continued)

C. OTHER FINANCING SOURCES (USES)	
1. Unclassified plan transfers	<u>(921,603)</u>
2. TOTAL OTHER FINANCING SOURCES (USES)	<u>\$ (921,603)</u>
D. DEFICIENCY OF INCOME AND OTHER SOURCES OVER DEDUCTIONS FROM INCOME AND OTHER USES	
	<u>\$ 8,291,722</u>
E. INCREASE IN UNFUNDED ACCRUED LIABILITY	
1. Unfunded accrued liability 6/30/85	\$360,556,065
2. Unfunded accrued liability 6/30/86	<u>368,847,787</u>
3. INCREASE IN UNFUNDED ACCRUED LIABILITY	<u>\$ 8,291,722</u>

Table 5

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Analysis of Change in the Unfunded Accrued Liability
During the Fiscal Year Ending June 30, 1986

1. Unfunded accrued liability as of June 30, 1985		\$360,556,065
2. Change due to current rate of funding and interest requirements		
a. 1985-86 past service contribution	(12,308,900)	
b. 8% interest requirement	<u>28,844,485</u>	16,535,585
3. Change due to actuarial gains (indicated by parentheses) or losses (no parentheses) because of experience deviations from expected		
a. Salary increases	11,243,001	
b. Investment income	(81,138,502)	
c. MPRI Fund mortality	61,565	
d. New entrants	4,971,026	
e. Withdrawals, death, disability of active members (balancing item)	<u>15,170,893</u>	(49,692,017)
4. Increase due to change in eligibility age for the pre-retirement spouse death benefit*		2,681,795
5. Decrease due to lowering the assumed cost of the cash refund annuity**		(11,660,941)
6. Increase due to changes in methods**		<u>50,427,300</u>
7. Unfunded accrued liability as of June 30, 1986		<u>\$368,847,787</u>

* See page 22

** See page 46

CONTRIBUTIONS

Chapters 352 and 356 set forth requirements as to the level of contributions. Chapter 352 prescribes the actual amount of contributions and Chapter 356 describes the method used to determine the amount of contribution required to fully fund the Normal Cost and the Unfunded Accrued Liability. Together, the actual contribution and required contribution are used to determine the sufficiency of the actual contribution. These calculations are illustrated in Tables 6(a) and 6(b).

Table 6(a)

MINNESOTA STATE RETIREMENT SYSTEM STATE EMPLOYEES' RETIREMENT FUND

General Employees' Plan Annual Requirement in Accordance With Chapter 356

	<u>% of Payroll*</u>	<u>Amount</u>
1. Normal cost	5.43	61,654,808
2. Assumed operating expense	.27	3,066,407
3. Amortization by June 30, 2010 of the Unfunded Accrued Liability of \$368,260,016	1.64	18,641,225
4. Total Chapter 356 requirement (1) + (2) + (3)	7.34	83,362,440

Actual Contributions:

1. Employee contributions	3.73	42,361,849
2. Employer contribution	3.90	44,292,550
3. Total Chapter 352A prescribed contribution	7.63	86,654,399

Contribution Sufficiency: 1.039

Note: Expected annual payroll = \$1,135,706,412

* Assumed that this percentage is contributed in each payroll period throughout the year ending June 30, 1987.

Table 6(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Correctional Employees' Plan Annual Requirement
in Accordance With Chapter 356

	<u>Percent of Payroll*</u>	<u>Amount</u>
1. Normal cost	9.28	3,113,050
2. Assumed operating expense	.27	90,541
3. Amortization by June 30, 2010 of the Unfunded Accrued Liability of \$587,771	.09	29,753
4. Total Chapter 356 requirement (1) + (2) + (3)	9.64	3,233,344

Actual Contributions:

1. Employee contributions	4.90	1,643,157
2. Employer contribution	8.70	2,917,443
3. Total Chapter 352A prescribed contribution	13.60	4,560,600

Contribution Sufficiency: 1.410

NOTE: Expected Annual Payroll = \$33,533,822

* Assumed that this percentage is contributed in each payroll period throughout the year ending June 30, 1987.

DEPTH OF FUNDING - PLAN CONTINUATION BASIS

The depth of funding is an indication of the extent to which the accrued benefits are funded and is measured by the ratio of valuation assets to the present value of accrued benefits. These measurements are made on the plan continuation basis (applying all ongoing actuarial assumptions including assumed salary increases and turnover) and are illustrated as follows:

Table 6(c)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Depth of Funding June 30, 1986

	<u>General</u>	<u>Correctional</u>
1. Active members	\$ 823,600,525	\$26,951,367
2. Deferred annuitants	20,146,387	2,648,360
3. Former members without vested rights	1,819,711	174,228
4. Additional liability due to July 1 retirees	61,066	11,627
5. Participation in MPRI Fund	<u>477,287,000</u>	<u>20,058,000</u>
6. Total present values of accrued benefits	\$1,322,914,689	\$49,843,582
7. Valuation assets	1,312,576,988	57,472,320
8. Depth of Funding (7/6)	99.22%	115.31%

) EMPLOYEE DATA

The Executive Director furnished us with employee information pertaining to all active members, inactive members and retired members of the Fund. Tables 7(a), 7(b), 7(c), 7(d), 8(a) and 8(b) summarize the changes in active, inactive and retired membership during the year in accordance with the requirements set forth in Section 356.215 of the Minnesota Statutes, Subdivisions 4 and 5. In addition, age and service distributions are provided in Tables 9(a) - 9(d).

In order to reflect anticipated current year salary increases, all salaries provided were increased by 6.5%.

PLAN VALUED

The provisions of the Minnesota State Retirement System, State Employees' Retirement Fund are governed principally by Chapters 352 and 11A of the Minnesota Statutes pertaining to MPRI Fund Benefits. Table 11 sets forth a summary of the principal provisions as of June 30, 1986.

) During fiscal 1985 the Legislature Commission on Pensions and Retirement passed a plan amendment effecting the State Employees Retirement Plan. The plan amendment changed the eligibility requirements for the pre-retirement spouse benefit from age 55 and 10 years of service to age 50 and 10 years of service. The benefit payment is to begin when the employee would have attained age 55. If the employee was already age 55 at the time of death, then the payments to the spouse would commence immediately.

Table 7(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Covered General Employees' Census Data as of June 30, 1986

	<u>Number</u>	<u>Annual Payroll</u>
Active at June 30, 1985	44,412	\$984,403,980
New Entrants*	<u>5,213</u>	
Total	49,625	
Less Separations from Active Service:		
Refund of Contributions*	2,556	43,944,484
Separation with a Deferred Annuity	107	2,295,214
Separation with Neither Refundment nor Right to a Deferred Annuity	880	9,171,907
Disability	25	488,842
Death, No Spouse's Benefits*	64	1,012,853
Service Retirement	786	19,864,621
Death Spouse's Benefits Payable	<u>13</u>	285,192
Total Separations	4,431	
Net Adjustments	(16)	0
Military	8	275,702
Net Transfers to and From Other Plans	<u>(15)</u>	
Active at June 30, 1986	<u>45,171</u>	<u>\$1,135,706,412**</u>

Average Entry Age of New Employees

<u>For the Fiscal Year Ending</u>	<u>Male</u>	<u>Female</u>	<u>Average of Total</u>
6/30/82	28.4	27.3	27.7
6/30/83	28.7	27.4	27.9
6/30/84	29.7	29.4	29.6
6/30/85	31.6	31.0	31.2
6/30/86	32.0	31.2	31.5

Average age at entry in State service for all active employees at 6/30/86:

Male	30.5
Female	30.4
Total	30.5

* Includes those who entered the plan and terminated during the period from July 1, 1985 to June 30, 1986.

** Includes 119 participants on workers' compensation for whom we included a total annual salary of \$2,144,142.

Table 7(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

General Employees' Annuitant Census Data as of June 30, 1986

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
A. <u>Service Retirement Annuitants</u>		
Receiving at June 30, 1985	10,152	\$38,053,476.00
New	870	4,981,957.20
Deaths	(420)	(1,422,938.40)
Adjustments-Net Result	<u>(11)</u>	<u>2,684,907.72</u>
Receiving at June 30, 1986*	10,591	\$44,297,402.52
B. <u>Disabled Employees</u>		
Receiving at June 30, 1985	680	1,956,400.20
New	40	142,343.28
Deaths	(52)	(153,773.28)
Adjustments-Net Result	<u>(3)</u>	<u>132,787.80</u>
Receiving at June 30, 1986	665	\$2,077,758.00
C. <u>Widows Receiving an Annuity or Survivor Benefit</u>		
Beneficiaries Receiving an Optional or Reversionary Annuity:		
Receiving at June 30, 1985	526	1,469,489.28
New	89	360,244.56
Deaths	(13)	(27,977.28)
Adjustments-Net Result	<u>(3)</u>	<u>85,658.28</u>
Receiving at June 30, 1986	599	\$1,887,414.84

* Includes three annuitants from Military Affairs.

Table 7(b) (continued)

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
D. <u>Deferred Annuitants</u>		
Deferred as of June 30, 1985	901	\$3,553,573.20
New	175	849,379.20
Began Receiving	(96)	(178,014.36)
Adjustments - Net Result	<u>(25)</u>	<u>(377,083.04)</u>
Deferred as of June 30, 1986	955	\$3,847,855.00

Average Age at Retirement of New Service Annuitants

<u>Fiscal Year Ending</u>	<u>Average Retirement Age</u>
6/30/81	63.4
6/30/82	63.2
6/30/83	63.3
6/30/84	64.0
6/30/85	64.0
6/30/86	62.6
All Existing Service Annuitants	64.1

Table 7(c)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Military Affairs Annuitant Census Data as of June 30, 1986

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
A. <u>Service Retirement Annuitants</u>		
Receiving at June 30, 1985	3	\$34,778.16
New	0	0.00
Deaths	0	0.00
Adjustments-Net Result	<u>0</u>	<u>2,742.00</u>
Receiving at June 30, 1986	3	\$37,520.16
B. <u>Disabled Employees</u>		
Receiving at June 30, 1986		None
C. <u>Widows Receiving an Annuity or Survivor Benefit</u>		
Receiving at June 30, 1986		None
D. <u>Children Receiving a Survivor Benefit</u>		
Receiving at June 30, 1986		None
E. <u>Deferred Annuitants</u>		
Deferred as of June 30, 1986		None

Average Age at Retirement of New Service Annuitants

<u>Fiscal Year Ending</u>	<u>Average Retirement Age</u>
6/30/82	---
6/30/83	---
6/30/84	---
6/30/85	---
6/30/86	---
All Existing Service Annuitants	60.0

Table 7(d)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Unclassified Plan Annuitant Census Data as of June 30, 1986

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
A. <u>Service Retirement Annuitants</u>		
Receiving at June 30, 1985	9	\$18,399.36
New	3	5,417.64
Deaths	0	0.00
Adjustments-Net Result	0	941.04
Receiving at June 30, 1986	12	\$24,758.04
B. <u>Disabled Employees</u>		
Receiving at June 30, 1986		None
C. <u>Widows Receiving an Annuity or Survivor Benefit</u>		
Receiving at June 30, 1986		None
D. <u>Children Receiving a Survivor Benefit</u>		
Receiving at June 30, 1986		None
E. <u>Deferred Annuitants</u>		
Deferred as of June 30, 1986		None

Average Age at Retirement of New Service Annuitants

<u>Fiscal Year Ending</u>	<u>Average Retirement Age</u>
6/30/82	---
6/30/83	60.8
6/30/84	67.1
6/30/85	67.1
6/30/86	64.2
All Existing Service Annuitants	63.2

Table 8(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Covered Correctional Employees' Census Data
as of June 30, 1986

	<u>Number</u>	<u>Annual Payroll</u>
Active at June 30, 1985	1,192	\$29,179,170
New Entrants*	<u>114</u>	
Total	1,306	
Less Separations from Active Service:		
Refund of Contributions*	71	1,370,164
Separation with a Deferred Annuity	6	128,187
Separation with Neither Refundment nor Right to a Deferred Annuity	16	246,171
Death	0	
Service Retirement	8	251,416
Disability	<u>0</u>	
Total Separations	101	
Net Transfers to and from other plans	<u>14</u>	
Active at June 30, 1986	1,219	\$33,533,822**

Average Entry Age of New Employees

<u>For the Fiscal Year</u> <u>Ending</u>	<u>Male</u>	<u>Female</u>	<u>Average of</u> <u>Total</u>
6/30/82	27.7	27.3	27.9
6/30/83	26.5	28.3	26.7
6/30/84	28.7	32.4	29.4
6/30/85	29.2	28.6	29.0
6/30/86	29.8	32.1	30.4

Average age at entry in State service for all active employees
at 6/30/86:

Male	29.0
Female	31.1
Total	29.3

* Includes those who entered the plan and terminated during
the period from July 1, 1985 to June 30, 1986.

** Includes three participants on workers' compensation for
whom we included a total annual salary of \$70,686.

Table 8(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Correctional Employees' Annuitant Census Data
as of June 30, 1986

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
A. <u>Service Retirement Annuitants</u>		
Receiving at June 30, 1985	309	\$1,984,228.68
New	9	110,781.00
Deaths	(9)	(35,806.80)
Adjustments-Net Result	<u>0</u>	<u>\$ 79,800.24</u>
Receiving at June 30, 1986	309	\$2,139,003.12
B. <u>Disabled Employees</u>		
Receiving at June 30, 1985	12	70,552.56
New	0	
Deaths	(1)	(4,000.56)
Adjustments-Net Result	<u>0</u>	<u>4,770.24</u>
Receiving at June 30, 1986	11	\$71,322.24
C. <u>Widows Receiving an Annuity or Survivor Benefit</u>		
Beneficiaries Receiving an Optional or Reversionary Annuity:		
Receiving at June 30, 1985	8	51,894.48
New	1	8,440.56
Adjustments-Net Result	<u>(1)</u>	<u>(4,925.76)</u>
Receiving at June 30, 1986	8	\$55,409.28

Table 8(b) (continued)

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
D. <u>Children Receiving a Survivor Benefit</u>	None	
E. <u>Deferred Annuitants</u>		
Deferred as of June 30, 1985	29	\$261,924.00
New	8	57,864.00
Began Receiving	(1)	(10,788.00)
Adjustments	(1)	(19,020.00)
Deferred as of June 30, 1986	35	\$289,980.00

Average Age at Retirement of New Service Annuitants

<u>Fiscal Year Ending</u>	<u>Average Retirement Age</u>
6/30/81	56.1
6/30/82	56.4
6/30/83	55.6
6/30/84	57.8
6/30/85	57.8
6/30/86	55.4
All Existing Service Annuitants	58.2

Table 9(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

General Employees

Service Groups by Age Groups

Age Group	Service Group							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 +	
Male								
0 - 19	37							37
20 - 24	582	44						626
25 - 29	1548	502	9					2059
30 - 34	1578	1304	484	11				3377
35 - 39	1233	1257	1290	374	31			4185
40 - 44	605	653	770	703	349	7		3087
45 - 49	345	387	357	476	455	204	38	2262
50 - 54	230	294	318	319	329	262	217	1969
55 - 59	188	272	267	318	225	252	293	1815
60 - 64	103	198	262	287	177	120	248	1395
65 - 69	21	47	64	64	24	26	30	276
70 - 74	1	2	4	2	0	1	1	11
75 - 79	0	0	0	0	0	0	0	0
80 - 84	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0
Total	6471	4960	3825	2554	1590	872	827	21099
Female								
0 - 19	63							63
20 - 24	1447	79						1526
25 - 29	3100	1164	44					4308
30 - 34	2301	1799	851	44				4995
35 - 39	1604	1281	784	511	29			4209
40 - 44	1021	719	430	306	151	18		2645
45 - 49	648	600	328	190	108	67	11	1952
50 - 54	399	361	340	199	88	78	44	1509
55 - 59	286	326	313	245	127	56	73	1426
60 - 64	138	237	238	270	140	44	61	1128
65 - 69	26	64	60	68	32	22	25	297
70 - 74	0	1	1	4	2	1	2	11
75 - 79	1	0	0	1	1	0	0	3
80 - 84	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0
Total	11034	6631	3389	1838	678	286	216	24072

Table 9(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

General Employees

Employee Salary Distribution

Distribution of Annual Earnings by Age Groups

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0 - 19	37	\$ 252899	\$ 6835	63	\$ 466173	\$ 7400	100	\$ 719072	\$ 7191
20 - 24	626	10105562	16143	1526	24746965	16217	2152	34852527	16195
25 - 29	2059	45950064	22317	4308	85996473	19962	6367	131946537	20724
30 - 34	3377	86938958	25744	4995	108396819	21701	8372	195335777	23332
35 - 39	4185	121507567	29034	4209	96713905	22978	8394	218221472	25997
40 - 44	3087	98961506	32058	2645	62696874	23704	5732	161658380	28203
45 - 49	2262	73632225	32552	1952	44466004	22780	4214	118098229	28025
50 - 54	1969	65305933	33167	1509	33745238	22363	3478	99051171	28479
55 - 59	1815	58716665	32351	1426	31395687	22017	3241	90112352	27804
60 - 64	1395	44489255	31892	1128	25449208	22561	2523	69938463	27720
65 - 69	276	8696526	31509	297	6454208	21731	573	15150734	26441
70 - 74	11	323394	29399	11	250586	22781	22	573980	26090
75 - 79	0	0	0	3	47718	15906	3	47718	15906
80 - 84	0	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0	0
Total	21099	\$614880554	\$29143	24072	\$520825858	\$21636	45171	\$1135706412	\$25142

Distribution of Annual Earnings by Service Groups

Service Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	1853	35261522	19029	3271	49861095	15243	5124	85122617	16613
1	2141	49436633	23090	3464	65039514	18776	5605	114476147	20424
2	952	23400364	24580	1645	33192525	20178	2597	56592889	21792
3	721	17806455	24697	1292	26150391	20240	2013	43956846	21836
4	804	21137356	26290	1362	28268793	20755	2166	49406149	22810
0-4	6471	147042330	22723	11034	202512318	18353	17505	349554648	19969
5-9	4960	144852708	29204	6631	152285254	22966	11591	297137962	25635
10-14	3825	123550282	32301	3389	85197731	25139	7214	208748013	28937
15-19	2554	83542081	32710	1838	48138641	26191	4392	131680722	29982
20-24	1590	53572016	33693	678	18649697	27507	2268	72221713	31844
25-29	872	31923849	36610	286	7940108	27763	1158	39863957	34425
30 +	827	30397288	36756	216	6102109	28251	1043	36499397	34995
TOTAL	21099	\$614880554	\$29143	24072	\$520825858	\$21636	45171	\$1135706412	\$25142

Table 9(c)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Correctional Employees

Service Groups by Age Groups

Age Group	Service Group							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 +	
Male								
0 - 19	1							1
20 - 24	61							61
25 - 29	166	46						212
30 - 34	102	94	32					228
35 - 39	74	65	74	12				225
40 - 44	32	38	36	17	7			130
45 - 49	9	24	15	19	15	2	1	85
50 - 54	9	18	18	14	11	10	2	82
55 - 59	1	2	7	8	5	3	0	26
60 - 64	0	1	0	5	1	0	0	7
65 - 69	0	0	0	0	0	0	0	0
70 - 74	0	0	0	0	0	0	0	0
75 - 79	0	0	0	0	0	0	0	0
80 - 84	0	0	0	0	0	0	0	0
85+	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	455	288	182	75	39	15	3	1057

<u>Female</u>								
0 - 19								0
20 - 24	10							10
25 - 29	32	7						39
30 - 34	23	13	3					39
35 - 39	22	5	6					33
40 - 44	4	3	2	1				10
45 - 49	4	4	2	2				12
50 - 54	3	1	2	2	0	1		9
55 - 59	0	2	1	3	0	0		6
60 - 64	1	2	0	0	1	0		4
65 - 69	0	0	0	0	0	0	0	0
70 - 74	0	0	0	0	0	0	0	0
75 - 79	0	0	0	0	0	0	0	0
80 - 84	0	0	0	0	0	0	0	0
85+	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	99	37	16	8	1	1	0	162

Table 9(d)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Correctional Employees

Employee Salary Distribution

Distribution of Annual Earnings by Age Groups

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0 - 19	1	\$ 8873	\$ 8873	0	\$ 0	\$ 0	1	\$ 8873	\$ 8873
20 - 24	61	1069338	17530	10	226627	22663	71	1295965	18253
25 - 29	212	5169381	24384	39	883514	22654	251	6052895	24115
30 - 34	228	6278567	27538	39	962008	24667	267	7240575	27118
35 - 39	225	6512617	28945	33	820226	24855	258	7332843	28422
40 - 44	130	3978649	30605	10	297404	29740	140	4276053	30543
45 - 49	85	2749908	32352	12	326732	27228	97	3076640	31718
50 - 54	82	2564616	31276	9	254639	28293	91	2819255	30981
55 - 59	26	888985	34192	6	200306	33384	32	1089291	34040
60 - 64	7	222962	31852	4	118470	29618	11	341432	31039
65 - 69	0	0	0	0	0	0	0	0	0
70 - 74	0	0	0	0	0	0	0	0	0
75 - 79	0	0	0	0	0	0	0	0	0
80 - 84	0	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0	0
Total	1057	\$29443896	\$27856	162	\$4089926	\$25246	1219	\$33533822	\$27509

Distribution of Annual Earnings by Service Groups

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	90	\$ 1747777	\$19420	26	\$ 510895	\$19650	116	\$ 2258672	\$19471
1	53	1128739	21297	18	410500	22806	71	1539239	21679
2	99	2345330	23690	33	772094	23397	132	3117424	23617
3	112	2800768	25007	15	376698	25113	127	3177466	25019
4	101	2688056	26614	7	178512	25502	108	2866568	26542
0-4	455	10710671	23540	99	2248699	22714	554	12959370	23392
5-9	288	8496542	29502	37	1024849	27699	325	9521391	29297
10-14	182	5856626	32179	16	482362	30148	198	6338988	32015
15-19	75	2502576	33368	8	260407	32551	83	2762983	33289
20-24	39	1276950	32742	1	41265	41265	40	1318215	32955
25-29	15	523566	34904	1	32344	32344	16	555910	34744
30 +	3	76965	25655	0	0	0	3	76965	25655
Total	1057	\$29443896	\$27856	162	\$4089926	\$25246	1219	\$33533822	\$27509

Table 10(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Retired General Annuitants in MPRIF*

Distribution of Years Retired by Age Groups

Age Group	Years Retired							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 +	
<u>Male</u>								
Under 40	1	1						2
40 - 44	0	0						0
45 - 49	0	0						0
50 - 54	1	0						1
55 - 59	109	0						109
60 - 64	648	13						661
65 - 69	1193	366	6					1565
70 - 74	190	994	145	5				1334
75 - 79	7	116	798	53	8			982
80 - 84	1	0	244	296	31	13	1	586
85 & over	<u>0</u>	<u>1</u>	<u>12</u>	<u>130</u>	<u>168</u>	<u>70</u>	<u>19</u>	<u>400</u>
Total	2150	1491	1205	484	207	83	20	5640
<u>Female</u>								
Under 40	1							1
40 - 44	2							2
45 - 49	6	0	0	1				7
50 - 54	11	0	0	0				11
55 - 59	77	6	1	1				85
60 - 64	469	41	6	1	0	1		518
65 - 69	893	350	18	0	2	1		1264
70 - 74	218	994	251	12	4	4	1	1484
75 - 79	6	131	810	68	21	5	1	1042
80 - 84	1	3	279	289	61	12	2	647
85 & over	<u>0</u>	<u>0</u>	<u>15</u>	<u>147</u>	<u>210</u>	<u>104</u>	<u>23</u>	<u>499</u>
Total	1684	1525	1380	519	298	127	27	5560

* includes widows

Table 10(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Retired General Annuitants in MPRIF

Distribution of Annual Benefits by Age Groups

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0 - 19	0	\$ 0	\$ 0	0	\$ 0	\$ 0	0	\$ 0	\$ 0
20 - 24	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0
30 - 34	1	1788	1788	0	0	0	1	1788	1788
35 - 39	1	1995	1995	1	1427	1427	2	3422	1711
40 - 44	0	0	0	2	6514	3257	2	6514	3257
45 - 49	0	0	0	7	19821	2832	7	19821	2832
50 - 54	1	729	729	11	38229	3475	12	38958	3247
55 - 59	109	876813	8044	85	399948	4705	194	1276761	6581
60 - 64	661	4845728	7331	518	2105478	4065	1179	6951206	5896
65 - 69	1565	9453054	6040	1264	4559118	3607	2829	14012172	4953
70 - 74	1334	6385832	4787	1484	4756379	3205	2818	11142211	3954
75 - 79	982	4228294	4306	1042	2876892	2761	2024	7105186	3510
80 - 84	586	1964647	3353	647	1496154	2312	1233	3460801	2807
85+	400	1233614	3084	499	985664	1975	899	2219278	2469
Total	5640	\$28992494	\$5141	5560	\$17245624	\$3102	11200	\$46238118	\$4128

Distribution of Annual Benefits by Service Groups

Service Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	347	\$ 2211582	\$6373	264	\$ 1022346	\$3873	611	\$3233928	\$5293
1	498	3361152	6749	386	1444246	3742	884	4805398	5436
2	473	2907741	6147	357	1374852	3851	830	4282593	5160
3	349	1950797	5590	298	1104228	3705	647	3055025	4722
4	483	3060550	6337	379	1532102	4042	862	4592652	5328
0-4	2150	13491821	6275	1684	6477774	3847	3834	19969595	5209
5-9	1491	7868022	5277	1525	4873959	3196	3016	12741981	4225
10-14	1205	5322634	4417	1380	4044490	2931	2585	9367124	3624
15-19	484	1415388	2924	519	1023344	1972	1003	2438732	2431
20-24	207	591102	2856	298	527971	1772	505	1119073	2216
25-29	83	240072	2892	127	238100	1875	210	478172	2277
30+	20	63455	3173	27	59986	2222	47	123441	2626
Total	5640	\$28992494	\$5141	5560	\$17245624	\$3102	11200	\$46238118	\$4128

Table 10(c)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Disabled General Annuitants in MPRIF*

Distribution of Years Retired by Age Groups

Age Group	Years Retired							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 +	
<u>Male</u>								
Under 40	2							2
40 - 44	6	1						7
45 - 49	4	1	1					6
50 - 54	14	6	1					21
55 - 59	22	11	6					39
60 - 64	50	46	17	2	2			117
65 - 69	17	69	17	4	4			111
70 - 74	0	40	38	8	1	0	1	88
75 - 79	0	0	12	9	2	1	0	24
80 - 84	0	0	0	8	4	0	2	14
85 +	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>3</u>	<u>2</u>	<u>6</u>
Total	115	174	92	31	14	4	5	435

<u>Female</u>								
Under 40	2							2
40 - 44	2	1						3
45 - 49	2	1	2					5
50 - 54	4	1	0					5
55 - 59	14	6	1	0	1			22
60 - 64	32	15	2	1	0			50
65 - 69	12	39	11	0	0			62
70 - 74	1	23	19	3	1			47
75 - 79	0	0	13	7	0	1		21
80 - 84	0	0	0	5	7	0		12
85 +	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>6</u>
Total	69	86	48	16	12	3	1	235

* includes widows

Table 10(d)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Disabled General Annuitants in MPRIF

Distribution of Annual Benefits by Age Groups

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0 - 19	0	\$ 0	\$ 0	0	\$ 0	\$ 0	0	\$ 0	\$ 0
20 - 24	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0
35 - 39	2	5765	2883	2	3587	1794	4	9352	2338
40 - 44	7	24298	3471	3	8222	2741	10	32520	3252
45 - 49	6	27047	4508	5	11699	2340	11	38746	3522
50 - 54	21	76365	3636	5	11880	2376	26	88245	3394
55 - 59	39	139850	3586	22	65658	2984	61	205508	3369
60 - 64	117	461382	3943	50	142267	2845	167	603649	3615
65 - 69	111	409595	3690	62	152369	2458	173	561964	3248
70 - 74	88	253354	2879	47	101732	2165	135	355086	2630
75 - 79	24	72035	3001	21	44052	2098	45	116087	2580
80 - 84	14	28766	2005	12	15000	1250	26	43766	1683
85 +	6	17348	2891	6	14466	2411	12	31814	2651
Total	435	\$1515805	\$3485	235	\$570932	\$2429	670	\$2086737	\$3115

Distribution of Annual Benefits by Service Groups

Service Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	18	\$ 72729	\$4041	10	\$ 28065	\$2807	28	\$ 100794	\$3600
1	21	69971	3332	10	25702	2570	31	95673	3086
2	22	71601	3255	16	44997	2812	38	116598	3068
3	24	100175	4174	19	48095	2531	43	148270	3448
4	30	137605	4587	14	37588	2685	44	175193	3982
0-4	115	452081	3931	69	184446	2673	184	636527	3459
5-9	174	649091	3730	86	238506	2773	260	887597	3414
10-14	92	280302	3047	48	92557	1928	140	372859	2663
15-19	31	79791	2574	16	25575	1598	47	105366	2242
20-24	14	30167	2155	12	21102	1759	26	51269	1972
25-29	4	9866	2467	3	6014	2004	7	15880	2269
30 +	5	14507	2901	1	2732	2732	6	17239	2873
Total	435	\$1515805	\$3485	235	\$570932	\$2429	670	\$2086737	\$3115

Table 10(e)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Correctional Annuitants in MPRIF
(Includes Retired and Disabled)

Distribution of Years Retired by Age Groups*

Age Group	Years Retired							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 +	
<u>Male</u>								
Under 40								0
40 - 44	0	1						1
45 - 49	0	0						0
50 - 54	3	1						4
55 - 59	38	0						38
60 - 64	24	49	2					75
65 - 69	6	47	37					90
70 - 74	0	12	43					55
75 +	<u>0</u>	<u>0</u>	<u>19</u>	—	—	—	—	<u>19</u>
Total	71	110	101	0	0	0	0	282
<u>Female</u>								
Under 40								0
40 - 44	1							1
45 - 49	0							0
50 - 54	3							3
55 - 59	5	1						6
60 - 64	4	4						8
65 - 69	2	3	8					13
70 - 74	0	0	13					13
75 +	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>2</u>
Total	15	8	23	0	0	0	0	46

* Includes years since January 1, 1974.

Table 10(f)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Correctional Annuitants in MPRIF

Distribution of Annual Benefits by Age Groups*

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
Under 40	0	\$ 0	\$ 0	0	\$ 0	\$ 0	0	\$ 0	\$ 0
40 - 44	1	6142	6142	1	7313	7313	2	13455	6728
45 - 49	0	0	0	0	0	0	0	0	0
50 - 54	4	28028	7007	3	34278	11426	7	62306	8901
55 - 59	38	508618	13385	6	39633	6606	44	548251	12460
60 - 64	75	749393	9992	8	67339	8417	83	816732	9840
65 - 69	90	454083	5045	13	39649	3050	103	493732	4794
70 - 74	55	209249	3805	13	29217	2247	68	238466	3507
75 - 79	19	88039	4634	2	4754	2377	21	92793	4419
80 - 84	0	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0	0
Total	282	\$2043552	\$ 7247	46	\$222183	\$ 4830	328	\$2265735	\$ 6908

Distribution of Annual Benefits by Service Groups

Service Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	7	\$ 89721	\$12817	1	\$ 5115	\$5115	8	\$ 94836	\$11855
1	12	142687	11891	2	15141	7571	14	157828	11273
2	29	335207	11559	4	35136	8784	33	370343	11223
3	6	63874	10646	5	53959	10792	11	117833	10712
4	17	210420	12378	3	20910	6970	20	231330	11567
0-4	71	841909	11858	15	130261	8684	86	972170	11304
5-9	110	750576	6823	8	39962	4995	118	790538	6699
10-14	101	451067	4466	23	51960	2259	124	503027	4057
15-19	0	0	0	0	0	0	0	0	0
20-24	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0
30+	0	0	0	0	0	0	0	0	0
Total	282	\$2043552	\$7247	46	\$222183	\$4830	328	\$2265735	\$6908

* Includes years since January 1, 1974.

Table 11

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Summary of Principal Plan Provisions as of June 30, 1986

A. General Employees

1. Coverage: From first date of employment.
2. Service Credit: Service is credited from date of coverage.
3. Contributions:
 - a. Employee: 3.73% of salary.
 - b. State of Minnesota 3.90% of salary.
4. Final Average Salary: Monthly average for the highest 5 successive years of salary.
5. Normal Retirement:
 - a. Eligibility: Earlier of:
 - attainment of age 65 and completion of 10 years of service; or
 - attainment of age 62 with 30 years of service.
 - at any point between April 27, 1984 and December 31, 1986, if age is greater than or equal to 55, and age plus service is greater than or equal to 85.
 - b. Benefit Amount: 1% of Final Average Salary for each of the first 10 years of service plus 1-1/2% of Final Average Salary for each year of service thereafter.
6. Early Retirement:
 - a. Eligibility: Earlier of:
 - attainment of age 55 and completion of 10 years of service; or
 - completion of 30 years of service.

Table 11 (continued)

- b. Benefit Amount: Normal Retirement benefit formula based on service and Final Average Salary to date of early retirement but actuarially reduced to reflect payment prior to age 65 (or age 62 if 30 years of service have been completed).
7. Form of Payment: Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are also available.
8. Disability Retirement:
- a. Eligibility: Earlier of:
- attainment of age 50 and completion of 5 years of service; or
 - completion of 10 years of service.
- b. Benefit Amount: Normal Retirement benefit formula based on service and Final Average Salary to date of Disability Retirement.
9. Deferred Service Retirement:
- a. Eligibility: Completion of 10 years of service and election to leave employee contributions on deposit.
- b. Benefit Amount: Retirement benefits payable at Normal Retirement date are determined according to the Normal Retirement benefit formula based on the member's Final Average Salary and service at termination, such amount being subject to an increase for each year between termination and retirement of 5% for years prior to January 1, 1981 and 3% compounded annually thereafter.

) Table 11 (continued)

10. Return of Contributions:

Upon termination of employment, a member may elect the return of contributions with 5% interest compounded annually in lieu of all other benefits under the plan.

11. Surviving Spouse Death Benefit:

a. Eligibility:

Death of member in service at least age 50 with 10 years of service or any age with 30 years of service. Between June 30, 1984 and June 30, 1986 the requirements were age 55 with 10 years of service. Prior to June 30, 1984, the requirements were age 58 with 20 years of service, or age 62 with at least 10 years of service.

) b. Benefit Amount:

The surviving spouse may elect one of:

- refund of member contributions with 5% interest (changed from 3-1/2% as of June 30, 1984); or
- 100% of the annuity the member would have received had he retired early (if eligible) and elected a 100% joint and survivor annuity commencing on the later of age 55 or his date of death. Prior to June 30, 1984, the benefit was a 50% joint and survivor annuity.
- benefit will commence later of member age 55 or date of death.

) Table 11 (continued)

12. Combined Service Provisions:

- | | |
|------------------------|--|
| a. Eligible Members: | Members who have had coverage under two or more Minnesota Public Retirement Systems, with a total of at least 10 years of credited service. |
| b. Benefit Provisions: | Benefits under both plans are based on the highest Final Average Salary including all years from both plans, and on the plans in effect on the member's last day in covered public employment. |

- | | |
|----------------------------|---|
| 13. Proportionate Annuity: | Any member who terminates after attaining age 65 and completing at least one year of service is entitled to a proportionate retirement annuity based on his allowable service credit. |
|----------------------------|---|

) B. Correctional Employees

Same as above except:

1. Contributions:

- | | |
|------------------------|------------------|
| a. Employee: | 4.90% of salary. |
| b. State of Minnesota: | 8.70% of salary. |

2. Normal Retirement:

- | | |
|------------------------|---|
| a. Eligibility: | Attainment of age 55 and completion of 10 years of service. |
| b. Retirement Benefit: | General Plan benefit plus an additional benefit defined below. |
| c. Additional Benefit: | Final Average Salary times the sum of: <ul style="list-style-type: none"> • 1-1/2% for each of first 10 years of service; plus |

) Table 11 (continued)

- o 1% for each of next 15 years of service; plus
- o 1/2% for each year of service thereafter.
- d. Limitation on Additional Benefit: That amount which, when added to the General Plan benefit, provides a retirement benefit of 75% of Final Average Salary.
- e. Additional Benefits Period: 84 months or until attainment of age 65, whichever comes first.
- f. Minimum Benefit Following Additional Benefit Period: That amount which, when added to Social Security benefits, equals the benefit payable during the additional benefit period.
- 3. Disability Retirement:
 - a. Eligibility:
 - In line of duty: None.
 - Not in line of duty: Five years of service and less than age 55.
 - b. Benefit Amount:
 - In line of duty: 50% of average monthly salary plus 2% for each year of service in excess of 20, offset by Workers' Compensation.
 - Not in line of duty: 2-1/2% of average monthly salary for each year up to and including 20 years, plus 2% for each year in excess of 20, subject to a minimum of 25%.
 - c. Limitation: At age 62, General Plan benefit based on credited service is payable subject to a minimum benefit of 10% of pay.

)

ACTUARIAL METHODS AND ASSUMPTIONS

Chapter 356 of the Minnesota Statutes calls for the determination of normal cost and accrued liability in accordance with the entry age normal cost method, one of several available projected cost methods. For the June 30, 1986 valuation, we used the individual entry age normal method, with salary scale.

The unfunded liability is amortized by the level percent of payroll method. (Each amortization payment is calculated as if the following year's payment will increase by 6.5%.)

Tables 12(a) through 12(e) summarize the actuarial assumptions used for this valuation. The only change in assumptions since the prior valuation is that the assumed cost of the cash refund annuity is changed from 2% to 1% of the present value of benefits for active members.

The entry age normal cost method does not specifically define the method for producing a split between present value of future normal costs and accrued liability for return of contributions. Several different approaches have been used which produce different results for the entry age normal accrued liability.

)

In the June 30, 1986 valuation we changed the method of allocating present value of return of contributions benefits between future normal costs and accrued liability. Our new method gives reasonable results which are also similar to those reported by the Wyatt Company, actuary for the Legislative Commission on Pensions and Retirement.

The new method does not change the present value of benefits, only the allocation between future costs and accrued liability. The accrued liability increased 3% as a result of the change in method.

Table 12(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Summary of Actuarial Assumptions and Methods

1. Mortality: 1971 Group Annuity Mortality Table with ages set back 8 years for females.
2. Post-Disablement Mortality: Combined Annuity Mortality Table.
3. Withdrawal: Graded rates based on actual experience developed by the June 30, 1971 experience analysis and set forth in the Separation from Active Service Table.
4. Expenses: Prior year's expenses expressed as a percentage of prior year's payroll.
5. Interest Rate: Pre-retirement - 8% per annum.
Post-retirement - 5% per annum.
6. Salary Scale: 6-1/2% per annum.
7. Assumed Retirement Age: Graded rates beginning at age 58 set forth in the Separation from Active Service Table. Fifty percent of those eligible to retire under the Rule of 85 are assumed to do so, and members age 65 or over are assumed to retire in one year hence.
8. Actuarial Cost Method: Entry age cost method, with normal cost determined as a level percentage of future covered payroll, on an individual basis.
9. Social Security: Based on the present law and 6-1/2% salary scale applicable to current salaries. Five and one half percent wage base and cost of living increases projected.
10. Return of Contributions: 60% of employees withdrawing before retirement are assumed to elect return of contributions in lieu of a deferred benefit.

Table 12(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Male General Members

Probabilities of Separation From Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	2,400	5		
21	2,250	5		
22	2,080	5		
23	1,920	6		
24	1,760	6		
25	1,600	6		
26	1,470	7		
27	1,340	7		
28	1,230	7		
29	1,130	8		
30	1,040	8	2	
31	950	9	2	
32	890	9	2	
33	830	10	2	
34	770	10	2	
35	720	11	2	
36	680	12	2	
37	640	13	2	
38	600	14	2	
39	560	15	2	
40	530	16	2	
41	500	18	2	
42	480	20	2	
43	460	23	3	
44	430	26	3	
45	410	29	3	
46	390	33	5	
47	370	38	7	
48	350	42	9	
49	340	47	11	

Table 12(b) (continued)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
50	320	53	14	
51	300	59	16	
52	280	65	20	
53	260	71	24	
54	240	78	28	
55	210	85	34	
56	170	93	40	
57	140	100	46	
58	90	109	56	30
59	40	119	66	30
60		131	76	40
61		144	90	150
62		159	110	500
63		174	136	500
64		192	174	2,000
65				10,000

Table 12(c)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Female General Members
Probabilities of Separation From Active Service
(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	3,700	4		
21	3,550	4		
22	3,390	4		
23	3,230	4		
24	3,070	4		
25	2,910	5		
26	2,750	5		
27	2,600	5		
28	2,430	5		
29	2,270	5		
30	2,120	5		
31	1,970	6		
32	1,820	6		
33	1,680	6		
34	1,540	7		
35	1,410	7	1	
36	1,300	7	1	
37	1,190	8	1	
38	1,090	8	1	
39	1,000	9	2	
40	920	9	2	
41	850	10	2	
42	780	10	4	
43	720	11	4	
44	680	12	4	
45	630	13	5	
46	590	14	6	
47	560	15	7	
48	530	16	7	
49	500	18	10	

Table 12(c) (continued)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
50	470	20	10	
51	440	23	12	
52	410	26	14	
53	390	29	16	
54	360	33	20	
55	330	38	24	
56	290	42	30	
57	230	47	36	
58	170	53	44	50
59	90	59	52	50
60		65	62	150
61		71	74	150
62		78	88	200
63		85	104	350
64		93	122	1,100
65				10,000

Table 12(d)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Male Correctional Members
Probabilities of Separation From Active Service
(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	2,400	5		
21	2,250	5		
22	2,080	5		
23	1,920	6		
24	1,760	6		
25	1,600	6		
26	1,470	7		
27	1,340	7		
28	1,230	7		
29	1,130	8		
30	1,040	8	2	
31	950	9	2	
32	890	9	2	
33	830	10	2	
34	770	10	2	
35	720	11	2	
36	680	12	2	
37	640	13	2	
38	600	14	2	
39	560	15	2	
40	530	16	2	
41	500	18	2	
42	480	20	2	
43	460	23	3	
44	430	26	3	
45	410	29	3	
46	390	33	5	
47	370	38	7	
48	350	42	9	
49	340	47	11	

Table 12(d) (continued)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
50	320	53	14	
51	300	59	16	
52	280	65	20	
53	260	71	24	
54	240	78	28	
55	210	85	34	
56	170	93	40	
57	140	100	46	
58				10,000

Table 12(e)

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Female Correctional Members
Probabilities of Separation From Active Service
(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	3,700	4		
21	3,500	4		
22	3,390	4		
23	3,230	4		
24	3,070	4		
25	2,910	5		
26	2,750	5		
27	2,600	5		
28	2,430	5		
29	2,270	5		
30	2,120	5		
31	1,970	6		
32	1,820	6		
33	1,680	6		
34	1,540	7		
35	1,410	7	1	
36	1,300	7	1	
37	1,190	8	1	
38	1,090	8	1	
39	1,000	9	2	
40	920	9	2	
41	850	10	2	
42	780	10	4	
43	720	11	4	
44	680	12	4	
45	630	13	5	
46	590	14	6	
47	560	15	7	
48	530	16	7	
49	500	18	10	

Table 12(e) (continued)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
50	470	20	10	
51	440	23	12	
52	410	26	14	
53	390	29	16	
54	360	33	20	
55	330	38	24	
56	290	42	30	
57	230	47	36	
58				10,000

APPENDIX 1

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

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* Chapters 356 and 11A of the Minnesota Statutes

** All as of June 30, 1986.

APPENDIX 2

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Military Affairs Calculation

Section 352.85 of Chapter 352 of Minnesota laws provides that certain military affairs personnel may retire at age 60 without being subject to the early retirement reduction of Section 352.116, Subdivision 1. 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.*

At the request of the Executive Director, we have made a determination as to whether the extra 3.2% contribution is sufficient to pay for the additional normal costs arising from the special benefits.

The results of our determination are as follows:

1. Number of active participants	5
2. Annual Payroll	\$159,032
3. Extra normal cost for special military affairs benefits:	
a. amount	0
b. percentage of pay	0

* Amended by 1982 Minnesota Laws. Previously, the extra contribution was 1% of payroll.

APPENDIX 3

MINNESOTA STATE RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND

Pilots Calculation

Section 352.86 of Chapter 352 of Minnesota laws provides that certain transportation department pilots may retire at age 62 without being subject to the early retirement reduction of Section 352.116, Subdivision 1. 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.

At the request of the Executive Director, we have made a determination as to whether the extra 3.2% contribution is sufficient to pay for the additional normal costs arising from the special benefits.

The results of our determination are as follows:

1. Number of active participants	2
2. Annual Payroll	\$78,788
3. Extra normal cost for special pilot benefits:	
a. amount	1,426
b. percentage of pay	1.81%
4. Sufficiency of extra 3.2% contribution 3.2% / 3(b)	176.8%

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

ACTUARIAL VALUATION AS OF
JUNE 30, 1986

Board of Directors
Minnesota State Retirement System
529 Jackson at 10th Street
St. Paul, Minnesota 55101

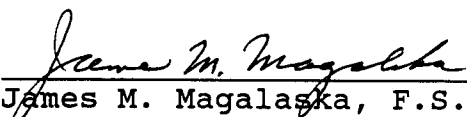
Ladies and Gentlemen:

We have performed an actuarial valuation of the Minnesota State Retirement System State Patrol Retirement Fund as of June 30, 1986.

The valuation was performed on the basis of accepted actuarial methods and procedures, in accordance with the applicable provisions set forth in Minnesota Statutes (Chapter 356) and stipulated in the Contract between the State of Minnesota and Touche Ross & Co.

We hereby certify that on the basis of our valuation, contributions required from employees and the State under Minnesota Statutes (Chapter 352B) represent 110.1% of the requirements set forth in Chapter 356. Furthermore, the entry age normal cost method was utilized in determining the accrued liability for all benefits payable under the Fund, and the valuation was completed in accordance with the rules adopted by the Legislative Commission on Pensions and Retirement, with the exception of the rule requiring a cash flow projection.

TOUCHE ROSS & CO.


James M. Magalaska, F.S.A.



James F. Verlautz, F.S.A.

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REPORT HIGHLIGHTS

	<u>6/30/85</u>	<u>6/30/86</u>
A. Financial and Actuarial Status		
1. Valuation Assets	\$100,486,325	\$118,174,622
2. Accrued Liability	134,439,674	148,523,566
3. Unfunded Accrued Liability	33,953,349	30,348,944
4. Accrued Liability Funding Ratio (A1/A2)	74.74%	79.57%
5. Normal Cost	4,755,909 (18.38) *	5,080,236 (18.49) *
B. Contributions		
1. Chapter 356 Requirement	6,624,700 (25.60) *	6,840,316 (24.90) *
2. Actual Prescribed Contribution (Chapter 352)	7,090,018 (27.40) *	7,527,935 (27.40) *
3. Sufficiency (2/1)	107.0%	110.1%
C. Depth of Funding - Plan Continuation Basis		
1. Present Value of Accrued Benefits	\$134,568,231	\$147,832,553
2. Depth of Funding (A1/C1)	74.67%	79.94%

* Parentheses indicate contribution levels as a percentage of valuation salaries.

REPORT HIGHLIGHTS (continued)

	<u>6/30/85</u>	<u>6/30/86</u>
D. Plan Participants		
1. Active Members		
a. Number	765	769
b. Valuation payroll	\$25,875,980	\$27,474,215
2. Retired Members/Beneficiaries		
a. Number	407	425
b. Average annual benefit payable	\$ 9,749	\$ 11,183
3. Deferred Annuitants		
a. Number	20	17
b. Average annual vested benefit	\$ 10,507	\$ 10,478
4. Former Members Without Vested Rights		
a. Number	9	10
b. Average employee contributions	\$ 2,627	\$ 4,910

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

ACTUARIAL VALUATION AS OF JUNE 30, 1986

PURPOSE AND SUMMARY

The purpose of this report is to set forth the financial status of the Minnesota State Retirement System (MSRS) State Patrol Retirement Fund in accordance with the applicable provisions set forth in Chapter 356 and Chapter 11A of the Minnesota Statutes.

Chapter 356 of the Minnesota Statutes sets forth the annual reporting requirements which govern the public employee retirement systems in Minnesota. The principal requirement (in addition to the experience study required every fourth year) is that an actuarial valuation be performed each year and that the valuation specifically set forth the following items based on an assumed 8% pre-retirement and 5% post-retirement interest rate, and a 6-1/2% salary scale assumption:

1. The assets of the plan and the present value of all benefits which will be payable from the plan.
2. The normal cost of the plan (as a level percentage of payroll) based on the entry age normal cost method.
3. The accrued liability of the plan, defined as the present value of all benefits less the present value of future entry age normal costs.
4. An actuarial balance sheet showing accrued assets, accrued liabilities, and the deficit from full funding of the accrued liability (unfunded accrued liability).
5. The annual contribution required to pay normal cost and amortize the June 30, 1986 unfunded accrued liability by June 30, 2009.
6. An analysis explaining the increase or decrease in the unfunded accrued liability since the last valuation.

Chapter 11A of the Minnesota Statutes pertains to the operation of the Minnesota Post Retirement Investment Fund (MPRI Fund). It includes requirements regarding the determination of the present value of benefits payable from the MPRI Fund (as of June 30, 1986 and as of January 1, 1987), and the corresponding mortality gain or loss each year, the latter to facilitate an appropriate transfer between the State Patrol Retirement Fund and the MPRI Fund.

) This reporting on the status of the State Patrol Retirement Fund as of June 30, 1986, is intended to comply with all of the requirements regarding actuarial reporting that are set forth in Chapters 356 and 11A of the Statutes. The Appendix at the end of the report cross-references the information of the Minnesota Statutes set forth herein with that specifically called for under Chapters 356 and 11A respectively.

VALUATION ASSETS

The Executive Director furnished us with a Financial Report setting forth the assets and liabilities of the Fund as of June 30, 1986. The Accounting Balance Sheet furnished by the Executive Director is set forth in Table 2(a).

ACTUARIAL BALANCE SHEETS

Table 2(b) sets forth an Actuarial Balance Sheet summarizing the actuarial valuation. Whereas the previously mentioned Accounting Balance Sheet (Table 2(a)) balances the current assets to date with current accumulated reserves for benefits payable, the Actuarial Balance Sheet compares total assets, including the present value of all future contributions payable to the plan, with the present value of all benefits payable from the plan.

) Table 3(a) sets forth a balance sheet comparing the assets and unfunded accrued liability (the total of the two equaling the accrued liability) to the current liabilities and reserves required under the plan. This table is in the format specifically required by Chapter 356 and is supported by Table 3(b) which sets forth the determination of the unfunded accrued liability as of June 30, 1986. The status of the MPRI fund as of June 30, 1986 was provided by The Wyatt Company, in their role as actuary for the Legislative Commission on Pensions and Retirement.

Table 1

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Summary of Actuarial Valuation as of June 30, 1986

A. BASIC DATA		
1. Active members		
a. Number		769
b. Valuation payroll	\$	27,474,215
2. Retired members/beneficiaries		
a. Number		425
b. Average annual benefit payable	\$	11,183
3. Deferred annuitants		
a. Number		17
b. Average annual vested benefit	\$	10,478
4. Former members without vested rights		
a. Number		10
b. Average employee contributions	\$	4,910
B. BASIC FINANCIAL RESULTS		
1. Normal cost	\$	5,080,236
2. Accrued liability		148,523,566
3. Valuation assets		118,174,622
4. Portion of accrued liability funded		79.57%
5. Unfunded accrued liability (2 - 3)	\$	30,348,944
C. DETERMINATION OF ANNUAL REQUIREMENT IN ACCORDANCE WITH CHAPTER 356*		
1. Normal cost	\$	5,080,236 (18.49)
2. Assumed operating expenses	\$	167,593 (0.61)
3. Amortization of the unfunded accrued liability by June 30, 2009	\$	1,592,487 (5.80)
4. Total Chapter 356 requirement (1 + 2 + 3)	\$	6,840,316 (24.90)
D. DETERMINATION OF CONTRIBUTION SUFFICIENCY**		
1. Actual prescribed contributions (Chapter 352B)		
a. Employee contributions	\$	2,335,308 (8.50)
b. Employer contribution	\$	5,192,627 (18.90)
c. Total of (a) and (b)	\$	7,527,935 (27.40)

Table 1 (continued)

2.	Chapter 356 requirements (Per Item C4)	\$ 6,840,316
3.	Sufficiency (1(c)/2)	110.1%
E. DEPTH OF FUNDING - PLAN CONTINUATION BASIS		
1.	Present value of accrued benefits	
a.	Active members	\$ 84,888,416
b.	Deferred annuitants	1,889,487
c.	Former members without vested rights	49,105
d.	Survivors - children	68,063
e.	Disabled members	823,290
f.	Participation in MPRI Fund	53,535,000
g.	6% Increase for Pre-73 Retirees	6,576,272
h.	Additional amounts for July 1 Retirees	2,920
i.	Total present value of accrued benefits	\$147,832,553
2.	Valuation assets	118,174,622
3.	Portion of accrued benefits funded (2 / 1(h))	79.94%

* Parentheses indicate Chapter 356 contribution levels as a percentage of salary.

** Estimated July 1, 1986 - June 30, 1987 contributions on an accrual basis. Parentheses indicate statutory annual contribution levels as a percentage of salary for Troopers under assumed retirement age, as set forth in Chapter 352B of the Minnesota Statutes.

Table 2(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Accounting Balance Sheet as of June 30, 1986

A. ASSETS			
1. Cash		\$	535
2. Short term investments (at cost)			5,035,109
3. Accounts receivable:			
a. Accrued employee contributions	111,778		
b. Accrued employer contributions	248,541		
c. Due from other funds	<u>3,437</u>		363,756
4. Interest receivable			27,638
5. Investment in debt securities (actuarial value)****			16,335,622
6. Investment in equities (actuarial value)*			43,716,871
7. Participation in MPRI Fund**			<u>53,535,000</u>
8. TOTAL ASSETS			<u>\$119,014,531</u>

B. LIABILITIES AND RESERVES

Liabilities

1. Due state employees retirement fund	\$	781,037
2. Due other funds		<u>58,872</u>
3. Total liabilities		<u>839,909</u>

Reserves

1. MPRI Fund Reserve**		53,535,000
2. Disability benefit reserve		823,290
3. Survivor benefit reserve - children		68,063
4. Employee contribution reserve		15,361,063
5. State contribution reserve		<u>48,387,206</u>
6. TOTAL REQUIRED RESERVES (Valuation Assets)***		118,174,622
7. TOTAL LIABILITIES AND RESERVES		<u>\$119,014,531</u>

* Market value as of June 30, 1986 is \$50,941,160 for equities.

** Participation equals Required Reserves for retired lives participating in MPRI Fund.

*** Portion of assets to be applied as valuation assets toward providing benefits.

**** The value at cost as of June 30, 1986 is \$16,326,217 for debt securities.

Table 2(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Actuarial Balance Sheet as of June 30, 1986

A. ASSETS

1. Assets on hand from accounting balance sheet:		
a. Reserves for MPRI Fund benefits	\$53,535,000	
b. All other assets	<u>65,479,531</u>	\$119,014,531
2. Present value of employees' future contributions		29,633,771
3. Present value of state future contributions applicable to:		
a. Entry age normal costs	29,843,277	
b. Statutory Supplemental Contribution	<u>45,163,029</u>	<u>75,006,306</u>
4. TOTAL ASSETS		<u>\$223,654,608</u>

B. LIABILITIES

1. Current liabilities from accounting balance sheet		839,909
2. Present value of earned and earnable benefits payable to presently active members:		
a. Current Benefit Obligations*	84,888,416	
b. Future Benefit Obligations	<u>60,168,061</u>	
Total for actives		145,056,477
3. Present value of benefits for deferred annuitants		1,889,487
4. Present value of refundment to former members without vested rights		49,105
5. Present value of survivor benefits - children		68,063
6. Present value of disability benefits		823,290
7. Participation in MPRI Fund		53,535,000
8. 6% increase in retirement benefits for pre-73 retirees		6,576,272
9. Additional liability due to July 1 Retirees		<u>2,920</u>
10. TOTAL LIABILITIES		<u>\$208,840,523</u>

C. PROJECTED BENEFIT FUNDING RATIO (A/B) 107.1%

* Includes augmentation of benefits equal to \$906,033.

Table 3(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Chapter 356 Balance Sheet as of June 30, 1986

ASSETS AND UNFUNDED ACCRUED LIABILITY

A. ASSETS*

1. Cash	\$ 535
2. Short term investments (at cost)	5,035,109
3. Accounts receivable:	363,756
4. Interest receivable	27,638
5. Investment in debt securities (actuarial value)	16,335,622
6. Investment in equities (actuarial value)	43,716,871
7. Participation in MPRI Fund**	<u>53,535,000</u>
8. TOTAL ASSETS	<u>\$119,014,531</u>

B. UNFUNDED ACCRUED LIABILITIES

1. Total unfunded accrued liability	<u>30,348,944</u>
2. TOTAL ASSETS AND UNFUNDED ACCRUED LIABILITIES	<u>\$149,363,475</u>

CURRENT LIABILITIES AND RESERVES REQUIRED

C. LIABILITIES

1. Due SER Fund	\$781,037
2. Due other funds	<u>58,872</u>
3. Total liabilities	<u>\$839,909</u>

D. RESERVES REQUIRED

1. Total reserves required per attached Table 3(b)	<u>\$148,523,566</u>
2. TOTAL CURRENT LIABILITIES AND RESERVES REQUIRED	<u>\$149,363,475</u>

* Accumulated contributions, without interest, of Troopers not yet retired amounted to \$15,361,063 as of June 30, 1986 (includes accrued but unpaid contributions).

** Participation equals Required Reserves for retired lives participating in the MPRI Fund.

Table 3(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Determination of Accrued Liability and
Unfunded Accrued Liability as of June 30, 1986

	<u>Present Value of Benefits</u>	<u>Present Value of Applicable Portion of Normal Cost Contribution</u>	<u>Accrued Liability Equals Reserves Required (1) - (2)</u>
A. DETERMINATION OF ACCRUED LIABILITY			
1. Active Members			
a. Retirement benefits	\$115,392,800	\$42,185,720	\$ 73,207,080
b. Disability benefits	10,642,190	5,523,409	5,118,781
c. Refundments due to death or withdrawal	377,262	951,722	(574,460)
d. Survivor and childrens' benefits	4,670,275	2,891,448	1,778,827
e. Vested termination benefits	<u>13,973,950</u>	<u>7,924,749</u>	<u>6,049,201</u>
f. Total active	145,056,477	59,477,048	85,579,429
2. Deferred Annuitants	1,889,487	-	1,889,487
3. Former members without vested rights	49,105	-	49,105
4. Survivors - children	68,063	-	68,063
5. Disabled members	823,290	-	823,290
6. Participation in MPRI Fund	53,535,000	-	53,535,000
7. 6% increase in retirement benefit fund for pre-73 retirees	6,576,272	-	6,576,272
8. Additional amounts due to July 1 Retirees	<u>2,920</u>	<u>-</u>	<u>2,920</u>
9. TOTAL	\$208,000,614	\$59,477,048	\$148,523,566
B. DETERMINATION OF UNFUNDED ACCRUED LIABILITY			
1. Accrued Liability	-	-	\$148,523,566
2. Valuation Assets	-	-	118,174,622
3. Unfunded Accrued Liability (1 - 2)	-	-	30,348,944

) CONTRIBUTIONS

Chapters 356 and 352B set forth requirements as to the level of contributions. Chapter 352B prescribes the actual amount of contributions and Chapter 356 describes the method used to determine the amount of contribution required to fully fund the Normal Cost and the Unfunded Accrued Liability. Together, the actual contribution and required contribution are used to determine the sufficiency of the actual contribution. These calculations are illustrated below, using a payroll figure of \$27,474,215.

Annual Requirement in Accordance with Chapter 356:

	<u>Percent of Payroll*</u>	<u>Amount</u>
1. Normal cost	18.49%	\$5,080,236
2. Assumed operating expense	.61	167,593
3. Amortization of the Unfunded Accrued Liability by June 30, 2009	5.80	1,592,487
4. Total Chapter 356 requirement (1 + 2 + 3)	24.90%	6,840,316

) Actual Contributions:

1. Employee contributions	8.50	\$2,335,308
2. Employer contribution	18.90	5,192,627
3. Total Chapter 352B prescribed contribution	27.40%	7,527,935

Contribution Sufficiency: 110.1%

* Assumed contributed in each payroll period during the year ending June 30, 1987.

The Chapter 356 requirement decreased from 25.60% of payroll at June 30, 1985 to 24.90% at June 30, 1986. This is primarily due to the reduction in Unfunded Accrued Liability resulting from the excellent asset performance during the year ended June 30, 1986.

) MINNESOTA POST RETIREMENT INVESTMENT FUND

Background

The Minnesota Post Retirement Investment Fund (MPRI Fund), previously termed the Minnesota Adjustable Fixed Benefit Fund (MAFB), is basically a vehicle for providing variable annuity payments to pensioners. When an active participant retires, assets equal to the present value of future benefits payable to that participant (and beneficiary, if applicable) are transferred from the State and Employee Contribution Reserves, to the MPRI Fund. Thereafter, benefits are paid from the MPRI Fund. Future benefit increases are determined on the basis of the investment performance of MPRI Fund assets.

Chapter 11A of the Minnesota Statutes provides a method for determining benefit increases. A benefit increase is granted in any year in which the earnings of MPRI Fund assets exceed 5%. In a year in which there is an MPRI Fund deficit (i.e., required reserves exceed MPRI Fund assets), 5% of any income in excess of the 5% requirement is credited towards amortizing the deficit, with the remaining 95% being used to provide benefit increases. If there is no MPRI Fund deficit, all income in excess of the required 5% is used to provide benefit increases.

) MPRI Fund Status as of June 30, 1986

Table 4 sets forth the determination of MPRI Fund net assets and reserve requirements as of June 30, 1986.

This information was developed by The Wyatt Company, actuaries for the Legislative Commission on Pensions and Retirement, and is reprinted here without verification.

UNFUNDED ACCRUED LIABILITY

Tables 5 and 6 reconcile the change in the unfunded accrued liability during the year. Table 5 sets forth a demonstration that the decrease in the unfunded accrued liability is equal to the excess of income over deductions during the year, where any decrease in required actuarial reserves is indicated as an income item. Table 6 sets forth our analysis of the change in the unfunded accrued liability.

Table 4

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Actuarial Information for
Determining MPRI Fund Benefit Increase

	<u>Amount on</u> <u>6/30/86</u>
1. Expected Reserves Assuming 5% Interest (MPRIF Participation Before Actuarial Gain or Loss)	\$52,753,963*
2. Required Reserves (MPRIF Participation After Actuarial Gain or Loss)	53,535,000**
3. Actuarial Gain (Loss) due to Mortality (1) - (2)	(781,037)

Required Reserves (line 2) Valued 1/1/87**

Members Eligible for Increase	\$46,139,000
Members Not Eligible for Increase	<u>6,733,000</u>
Total	\$52,872,000

* Information supplied by State Board of Investment.

** This information was supplied by The Wyatt Company, actuaries for the Legislative Commission on Pensions and Retirement.

Table 5

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Analysis of Income and Deductions From Income and
Effect on the Unfunded Accrued Liability

A. INCOME AND OTHER FINANCIAL SOURCES			
1. Contributions from employees			\$ 2,062,048
2. Contributions from employers			4,598,375
3. From investments			
a. Investment income	\$ 7,419,076		
b. General fund appropriation	62,316		
c. Gain on sale of stock	717,671		
d. Investment fees	<u>(87,880)</u>		8,111,183
4. From MPRI Fund participation			5,549,576
5. Unrealized Gains			<u>2,124,466</u>
6. TOTAL INCOME			<u>\$22,445,648</u>
B. DEDUCTIONS FROM INCOME AND OTHER FINANCING USES			
1. Benefits			
a. Service retirement annuities	\$ 4,566,626		
b. Disability retirement benefits & children	57,291		
c. Survivor benefits (spouses & children)	<u>22,332</u>		\$ 4,646,249
2. Refundments with interest (employee contributions)			51,687
3. Administrative expenses			59,415
4. Increase in total reserves required			
a. Reserves required 6/30/85	134,439,674		
b. Reserves required 6/30/86	<u>148,523,566</u>		<u>14,083,892</u>
5. TOTAL DEDUCTIONS FROM INCOME			<u>18,841,243</u>
6. EXCESS OF INCOME OVER DEDUCTIONS FROM INCOME			<u>\$ 3,604,405</u>
C. DECREASE IN UNFUNDED ACCRUED LIABILITY			
1. Unfunded accrued liability 6/30/85			\$33,953,349
2. Unfunded accrued liability 6/30/86			<u>30,348,944</u>
3. DECREASE IN UNFUNDED ACCRUED LIABILITY			<u>\$ 3,604,405</u>

Table 6

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Analysis of Change in the Unfunded Accrued Liability
During the Fiscal Year Ending June 30, 1986

1. Unfunded accrued liability as of June 30, 1985		\$33,953,349
2. Change due to current rate of funding and interest requirements		
a. 1985-86 past service contribution	\$(1,892,316)	
b. 8% interest requirement	<u>2,716,268</u>	823,952
3. Change due to actuarial gains (indicated by parentheses) or losses (no parentheses) because of experience deviations from expected		
a. Salary increases	\$ (55,605)	
b. Investment Income	(5,845,179)	
c. MPRI Fund mortality	781,037	
d. Withdrawals, death, disability of active members (balancing item)	<u>691,390</u>	<u>(4,428,357)</u>
4. Unfunded accrued liability as of June 30, 1986		<u>\$30,348,944</u>

) EMPLOYEE DATA

The Executive Director furnished us with employee information pertaining to all active members, inactive members and retired members of the Fund. Tables 7 and 8 summarize the changes in active, inactive and retired membership during the year in accordance with the requirements set forth in Section 356.215 of the Minnesota Statutes, Subdivisions 4 and 5. In addition, age, service and salary distributions are provided in Tables 9(a) and 9(b).

In order to reflect anticipated current year salary increases, all salaries provided were increased by 6.5%.

PLAN VALUED

The provisions of the Minnesota State Retirement System, State Patrol Retirement Fund are governed principally by Chapters 352B and 11A of the Minnesota Statutes pertaining to MPRI Fund Benefits. Table 10 sets forth a summary of the principal provisions as of June 30, 1986.

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Table 7

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Covered State Troopers Census Data as of June 30, 1986

	<u>Number</u>	<u>Annual Payroll</u>
Active at June 30, 1985	765	\$25,875,980
New Entrants*	<u>38</u>	
Total	803	
Less Separations from Active Service:		
Refund of Contributions*	3	67,635
Separation with a Vested Right to a Deferred Annuity	1	35,001
Separation with Neither Refundment nor Right to a Deferred Annuity	2	28,636
Death While Eligible, Surviving Spouse Receiving Annuity	0	0
Service Retirement	27	942,172
Death	<u>0</u>	0
Total Separations	33	
Adjustments	(1)	(270,045)
Active at June 30, 1986	769	\$27,474,215

Average Entry Age of New Employees

<u>For the Fiscal Year Ending</u>	<u>Male</u>	<u>Female</u>	<u>Average of Total</u>
6/30/82	24.7	-	24.7
6/30/83	26.4	23.0	26.2
6/30/84	28.0	31.7	28.3
6/30/85	27.8	23.5	27.4
6/30/86	26.5	22.8	26.4

Average age at entry in State service for all active employees at 6/30/86:

Male	26.9
Female	25.1
Total	26.8

* Includes those who entered the plan and terminated during the period from July 1, 1985 to June 30, 1986.

Table 8

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

State Troopers Annuitant Census Data as of June 30, 1986

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
A. <u>Service Retirement Annuitants</u>		
Receiving at June 30, 1985	285	\$3,331,777.00
New	30	559,657.80
Deaths	(7)	(52,800.36)
Adjustments-Net Result	<u>(2)</u>	<u>241,069.40</u>
Receiving at June 30, 1986	306	\$4,079,703.84
B. <u>Disabled Employees</u>		
Receiving at June 30, 1985	13	135,165.84
New	0	0.00
Deaths	0	0.00
Adjustments-Net Result	<u>0</u>	<u>8,089.08</u>
Receiving at June 30, 1986	13	\$ 143,254.92
C. <u>Widows Receiving an Annuity or Survivor Benefit</u>		
Beneficiaries Receiving an Optional or Reversionary Annuity:		
Receiving at June 30, 1985	96	474,859.00
New	4	14,640.96
Deaths	(4)	(11,648.52)
Adjustments-Net Result	<u>1</u>	<u>31,275.68</u>
Receiving at June 30, 1986	97	\$ 509,127.12

Table 8 (continued)

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
D. <u>Children Receiving a Survivor Benefit</u>		
Receiving at June 30, 1985	13	\$ 26,057.52
New	0	0
Reinstated	0	0
No longer eligible	(5)	(8,733.72)
Adjustments-Net Result	<u>1</u>	<u>3,226.32</u>
Receiving at June 30, 1986	9	\$ 20,550.12
E. <u>Deferred Annuitants</u>		
Deferred as of June 30, 1985	20	210,143.16
New	1	23,676.00
Began Receiving	(3)	(25,740.00)
Adjustments-Net Result	<u>(1)</u>	<u>(29,952.00)</u>
Deferred as of June 30, 1986	17	\$178,127.16

Average Age at Retirement of New Service Annuitants

<u>Fiscal Year Ending</u>	<u>Average Retirement Age</u>
6/30/81	61.4
6/30/82	58.6
6/30/83	59.8
6/30/84	58.6
6/30/85	58.3
6/30/86	58.2
All Existing Service Annuitants	58.2

Table 9(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Service Groups by Age Groups

Age Group	Service Group							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
Male								
0-19								0
20-24	19							19
25-29	66	29						95
30-34	35	67	11					113
35-39	14	32	54	33				133
40-44	2	11	28	104	5			150
45-49	1	3	3	55	35	4		101
50-54	0	0	2	8	27	37	3	77
55-59	0	1	2	3	12	15	11	44
60-64	0	0	1	3	3	1	1	9
65-69	0	0	0	0	0	1	0	1
70-74	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0
85+	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	137	143	101	206	82	58	15	742
Female								
0-19	0							0
20-24	3							3
25-29	5	3						8
30-34	0	3	5					8
35-39	0	1	2	1				4
40-44	0	1	2	0				3
45-49	0	0	0	0				0
50-54	0	0	0	0				0
55-59	0	0	1	0				1
60-64	0	0	0	0				0
65-69	0	0	0	0				0
70-74	0	0	0	0				0
75-79	0	0	0	0				0
80-84	0	0	0	0				0
85+	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	8	8	10	1	0	0	0	27

Table 9(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Distribution of Annual Earnings by Age Groups

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0-19	0	\$ 0	\$ 0	0	\$ 0	\$ 0	0	\$ 0	\$ 0
20-24	19	\$ 475,477	25,025	3	85,578	28,526	22	561,055	25,503
25-29	95	2,860,561	30,111	8	251,853	31,482	103	3,112,414	30,218
30-34	113	3,741,983	33,115	8	273,038	34,130	121	4,015,021	33,182
35-39	133	4,805,827	36,134	4	158,111	39,528	137	4,963,938	36,233
40-44	150	5,652,383	37,683	3	116,591	38,864	153	5,768,974	37,706
45-49	101	3,816,362	37,786	0	0	0	101	3,816,362	37,786
50-54	77	3,047,782	39,582	0	0	0	77	3,047,782	39,582
55-59	44	1,726,537	39,239	1	39,823	39,823	45	1,766,360	39,252
60-64	9	385,177	42,797	0	0	0	9	385,177	42,797
65-69	1	37,132	37,132	0	0	0	1	37,132	37,132
70-74	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0	0
Total	742	\$26,549,221	\$35,781	27	\$ 924,994	\$34,259	769	\$27,474,215	\$35,727

Distribution of Annual Earnings by Service Groups

Service Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	36	\$ 847,173	\$23,533	1	\$ 28,833	\$28,833	37	\$ 876,006	\$23,676
1	11	314,949	28,632	1	27,900	27,900	12	342,849	28,571
2	44	1,289,775	29,313	3	84,531	28,177	47	1,374,306	29,241
3	42	1,307,581	31,133	3	99,373	33,124	45	1,406,954	31,266
4	4	133,539	33,385	0	0	0	4	133,539	33,385
0-4	137	3,893,017	28,416	8	240,637	30,080	145	4,133,654	28,508
5-9	143	4,930,658	34,480	8	273,065	34,133	151	5,203,723	34,462
10-14	101	3,892,818	38,543	10	365,761	36,576	111	4,258,579	38,366
15-19	206	7,778,844	37,761	1	45,530	45,530	207	7,824,374	37,799
20-24	82	3,142,628	38,325	0	0	0	82	3,142,628	38,325
25-29	58	2,299,587	39,648	0	0	0	58	2,299,587	39,648
30+	15	611,670	40,778	0	0	0	15	611,670	40,778
TOTAL	742	\$26,549,222	\$35,781	27	\$ 924,993	\$34,259	769	\$27,474,215	\$35,727

Table 9(c)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Retiree Age Distribution

Annuitants in MPRIF

Male Service Groups

Age Group	Years Retired							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
0-19								0
20-24								0
25-29								0
30-34								0
35-39								0
40-44								0
45-49								0
50-54								0
55-59	52							52
60-64	70	28	1					99
65-69	18	38	12					68
70-74	1	12	25	9				47
75-79	0	0	3	15	12			30
80-84	0	0	3	3	4	5		15
85+	0	0	0	3	0	0	0	3
Total	141	78	44	30	16	5	0	314

Female Service Group

0-19								0
20-24								0
25-29								0
30-34	0	0	1					1
35-39	0	0	0					0
40-44	0	0	0					0
45-49	0	0	0					0
50-54	1	2	0	1				4
55-59	2	4	2	1				9
60-64	1	4	2	1	1			9
65-69	1	3	3	3	0	1		11
70-74	0	0	6	2	7	2		17
75-79	0	0	1	7	3	4	2	17
80-84	0	0	1	2	4	6	1	14
85+	0	0	0	1	3	8	4	16
Total	5	13	16	18	18	21	7	98

Table 9(d)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Retiree Benefit Distribution

Annuitants in MPRIF

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
Under 50	0	\$ 0	\$ 0	1	\$ 2,990	\$2,990	1	\$ 2,990	\$ 2,990
50-54	0	0	0	4	27,112	6,778	4	27,112	6,778
55-59	52	835,795	16,073	9	86,052	9,561	61	921,847	15,112
60-64	99	1,584,369	16,004	9	82,636	9,182	108	1,667,005	15,435
65-69	68	893,300	13,137	11	72,918	6,629	79	966,218	12,231
70-74	47	499,136	10,620	17	84,651	4,979	64	583,787	9,122
75-79	30	217,691	7,256	17	67,770	3,986	47	285,461	6,074
80-84	15	103,428	6,895	14	46,360	3,311	29	149,788	5,165
85+	3	22,298	7,433	16	49,101	3,069	19	71,399	3,758
Total	314	\$4,156,017	\$13,236	98	\$519,590	\$5,302	412	\$4,675,607	\$11,349

Distribution of Annual Benefits by Years of Retirement

Years Retired	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	29	\$ 541,809	\$18,683	0	\$ 0	\$ 0	29	\$ 541,809	\$18,683
1	18	286,671	15,926	0	0	0	18	286,671	15,926
2	36	564,032	15,668	1	10,163	10,163	37	574,195	15,519
3	31	511,921	15,514	2	15,223	7,612	33	527,144	15,974
4	27	438,130	16,227	2	31,916	15,958	29	470,046	16,208
0- 4	141	2,342,562	16,614	5	57,302	11,460	146	2,399,864	16,437
5- 9	78	1,042,595	13,367	13	136,884	10,530	91	1,179,479	12,961
10-14	44	443,244	10,074	16	106,155	6,635	60	549,399	9,157
15-19	30	212,793	7,093	18	77,245	4,291	48	290,038	6,042
20-24	16	88,136	5,509	18	55,823	3,101	34	143,959	4,234
25-29	5	26,687	5,337	21	64,508	3,072	26	91,195	3,508
30+	0	0	0	7	21,674	3,096	7	21,674	3,096
TOTAL	314	\$4,156,017	\$13,236	98	\$519,590	\$5,302	412	\$4,675,607	\$11,349

Table 10

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Summary of Principal Plan Provisions as of June 30, 1986

1. Coverage: From first date of employment.
2. Service Credit: Service is credited from date of coverage. For State Police Officers hired after July 1, 1961, no service is credited after age 60.
3. Contributions:
 - a. Employee: 8.5% of salary.
 - b. State of Minnesota: 18.9% of salary.
4. Final Average Salary: Monthly average for the highest 5 successive years of salary.
5. Normal Retirement:
 - a. Eligibility: Attainment of age 55 and completion of 10 years of service.
 - b. Benefit Amount: 2-1/2% of Final Average Salary for each of the first 25 years of service, plus 2% of Final Average Salary for each year of service thereafter.
6. Form of Payment: Life annuity with actuarially equivalent options also available.
7. Disability Retirement:
 - a. Eligibility:
 - In line of duty: None.
 - Not in line of duty: Five years of service and less than age 55.

) Table 10 (continued)

- b. Benefit Amount:
- In line of duty: 50% of average monthly salary plus 2% for each year of service in excess of 20, offset by Workers' Compensation.
 - Not in line of duty: 2-1/2% of average monthly salary for each year up to and including 25 years, plus 2% for each year in excess of 25, subject to a minimum of 25% of average monthly salary.
- c. Death Benefits: If a member dies while receiving a work related disability benefit, 20% of his Final Average Salary is payable to the surviving spouse for life.
8. Deferred Service Retirement:
- a. Eligibility: Completion of 10 years of service.
- b. Benefit Amount: Retirement benefits payable at normal retirement date are determined according to the normal retirement benefit formula based on the member's Final Average Salary and service at termination, such amount being subject to an increase for each year between termination and retirement of 5% for years prior to January 1, 1981 and 3% compounded annually thereafter.
9. Return of Contributions: If a member terminates before becoming eligible for any other benefits under the plan, his employee contributions are returned with interest at 5%.

) Table 10 (continued)

10. Surviving Spouse Death Benefit:

- a. Eligibility: Death of member in service.
- b. Benefit Amount: 20% of Final Average Salary. With 10 or more years of service, changes to a 100% Joint & Survivor annuity amount as of the date the employee would have attained age 55.

11. Children's Death Benefits:

- a. Eligibility: Death benefits are payable to children (below age 18, or 22 if a student) of members who die in active service.
- b. Amount: 10% of Final Average Salary, plus \$20 per month prorated equally to such children.
- c. Maximum: Total benefit to all children may not exceed 40% of Final Average Salary.

) 12. Repayment of Contributions:

- a. Eligible Members: Rehired members.
- b. Repayment Provision: Such rehired member may repay all refundments made to him, including interest at 5% compounded annually. In such case, service previously credited during the prior period of membership is restored.

) 13. Combined Service Provisions:

- a. Eligible Members: Members who have had coverage under two or more Minnesota Public Retirement Systems, with a total of at least 10 years of credited service.

) Table 10 (continued)

- b. Benefit Provisions: Benefits under both plans are based on the highest Final Average Salary including all years from both plans, and on the plans in effect on the member's last day in covered public employment.
14. Proportionate Annuity: Any member who terminates after attaining age 65 and completing at least one year of service is entitled to a proportionate retirement annuity based on his allowable service credit.
15. Pre-1973 Annuitants: State Troopers who retired prior to 1973 are entitled to an annual 6% increase in benefits.
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) ACTUARIAL METHODS AND ASSUMPTIONS

Actuarial Methods

Chapter 356 of the Minnesota Statutes calls for the determination of normal cost and accrued liability in accordance with the entry age normal cost method, one of several available projected cost methods. For the June 30, 1986 valuation, we used the traditional individual entry age normal method with normal costs determined as a percentage of salary.

The normal cost as a percentage of payroll for disability, refund, survivor and vested termination benefits is determined by dividing the present value at entry of the applicable benefit by the present value at entry of future compensation.

The unfunded liability is amortized by the level percent of payroll method. (Each amortization payment is calculated as if the following year's payment will increase by 6.5%.)

Actuarial Assumptions

Tables 11(a) and 11(b) summarize the actuarial assumptions used for this valuation. No changes in assumptions have occurred since the prior valuation.

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Table 11(a)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Summary of Actuarial Assumptions and Methods

1. Mortality: 1971 Group Annuity Mortality Table with ages set back 8 years for females.
2. Withdrawal: Rates starting at .03 at age 20 and decreasing to zero at age 55, as set forth in the Separation From Active Service Table.
3. Disability: The rates of disability were adapted from experience of the New York State Employees' Retirement System, as set forth in the Separation From Active Service Table.
4. Expenses: Prior year expenses expressed as a percentage of prior year payroll.
5. Interest Rate: Pre-retirement - 8% per annum.
Post-retirement - 5% per annum.
6. Salary Scale: 6-1/2% per annum, disregarding actual salary history. Benefits in excess of IRC Sec. 415 limits caused by salary increases are disregarded.
7. Assumed Retirement Age: Later of 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, and one year hence.
8. Actuarial Cost Method: Individual level percent entry age cost method.
9. Assumed Survivor Status: 100% assumed married, female spouse 3 years younger. Fifteen percent load on spouse benefits for children's benefits.

) 10. Contribution Refund:

All employees withdrawing after ten years of service were assumed to leave their contributions on deposit and receive a deferred annuitant benefit. Retirement, death and disability benefits were loaded 2% for modified cash refund.

Table 11(b)

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Probabilities of Separation From Active Service
(Number Separating at Each Age Per 10,000 Working at That Age)

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

Table 11(b) (continued)

<u>Age</u>	<u>Death*</u>		<u>Withdrawal**</u>	<u>Disability**</u>
	<u>Males</u>	<u>Females</u>		
55	85	38		88
56	93	42		98
57	100	47		108
58	109	53		118
59	119	59		129
60	131	65		141
61	144	71		154
62	159	78		167

* 1971 Group Annuity Mortality Table, with age set back 8 years for females.

** Same withdrawal and disability rates pertain to males and females.

APPENDIX

MINNESOTA STATE RETIREMENT SYSTEM
STATE PATROL RETIREMENT FUND

Table References to Chapter 356 and Chapter 11A*

Table Number	Description**	References
1	Summary of Actuarial Valuation as of June 30, 1986	356.215 Subd. 4(1) 356.215 Subd. 4(7)
2(a)	Accounting Balance Sheet	
2(b)	Actuarial Balance Sheet	
3(a)	Chapter 356 Balance Sheet	356.20 Subd. 4(1) 356.215 Subd. 4(2)
3(b)	Determination of Accrued Liability and Unfunded Accrued Liability	356.215 Subd. 4(6) 356.215 Subd. 4(8)
4	Actuarial Information for Determining MPRI Fund Benefit Increase	11A.18 Subd.(9),(11)
5	Analysis of Income and Deductions From Income and Effect on the Unfunded Accrued Liability	356.20 Subd. 4(2) 356.20 Subd. 4(3) 356.215 Subd. 4(11)
6	Analysis of Change in the Unfunded Accrued Liability During the Fiscal Year Ending June 30, 1986	356.215 Subd. 4(9)
7	Covered State Troopers Census Data	
8	State Troopers Annuitant Census Data	356.20 Subd. 4(4) 356.215 Subd. 4(10)
9(a)	Service Groups by Age Groups	
9(b)	Distribution of Annual Earnings by Age Groups	
9(c)	Retiree Age Distribution	
9(d)	Retiree Benefit Distribution	
10	Summary of Principal Plan Provisions	356.215 Subd. 4(12)
11(a)	Summary of Actuarial Assumptions and Methods	
11(b)	Probabilities of Separation from Active Service	356.215 Subd. 4(4) 356.215 Subd. 4(5)

* Chapter 356 and 11A of the Minnesota Statutes.

** All as of June 30, 1986.

MINNESOTA STATE RETIREMENT SYSTEM

JUDGES' RETIREMENT FUND

ACTUARIAL VALUATION AS OF

JUNE 30, 1986

Board of Directors
Minnesota State Retirement System
529 Jackson at 10th Street
St. Paul, Minnesota 55101

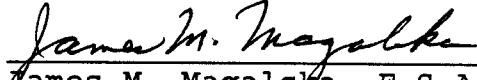
Ladies and Gentlemen:

We have performed an actuarial valuation of the Minnesota State Retirement System Judges' Retirement Fund as of June 30, 1986.

The valuation was performed on the basis of accepted actuarial methods and procedures, in accordance with the applicable provisions set forth in Minnesota Statutes (Chapter 356) and stipulated in the Contract between the State of Minnesota and Touche Ross & Co.

We hereby certify that the entry age normal cost method was utilized in determining the accrued liability for all benefits payable under the Fund, and that the valuation was completed in accordance with the rules adopted by the Legislative Commission on Pensions and Retirement, with the exception of the rule requiring a cash flow projection.

TOUCHE ROSS & CO.


James M. Magalska, F.S.A.


James F. Verlautz, F.S.A.

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REPORT HIGHLIGHTS

June 30, 1986 Valuation

	<u>Judges'</u> <u>Plan</u>	<u>Supreme</u> <u>Court</u> <u>Justices*</u>	<u>Total</u>
A. Financial and Actuarial Status			
1. Valuation Assets	\$15,982,674	\$ --	\$15,982,674
2. Accrued Liability	50,556,360	545,573	51,101,933
3. Unfunded Accrued Liability (2 - 1)	34,573,686	545,573	35,119,259
4. Accrued Liability Funding Ratio (1 / 2)	31.61%	0.00%	31.28%
5. Normal Cost	2,189,895	35,557	2,225,452
B. Contributions			
1. Chapter 356 Requirement**	4,045,274 (24.54)	64,516 (48.65)	4,109,790 (24.73)
2. Actual Prescribed Contribution	669,400 (4.06)	5,304 (4.00)	674,704 (4.06)
C. Depth of Funding - Plan Continuation Basis			
1. Present Value of Accrued Benefits	\$56,945,475	\$594,517	\$57,539,992
2. Depth of Funding (A1/C1)	28.07%	--	27.78%

* Active Justices only - All retired Justices are included in Judges' Plan.

** Parentheses indicate contribution levels as a percentage of the valuation salaries (\$16,483,538 for Judges, \$132,600 for Justices).

REPORT HIGHLIGHTS

Comparison with Previous Valuation

	<u>6/30/85</u>	<u>6/30/86</u>
A. Financial and Actuarial Status		
1. Valuation Assets	\$13,784,402	\$15,982,674
2. Accrued Liability	46,842,898	51,101,993
3. Unfunded Accrued Liability	33,058,496	35,119,259
4. Accrued Liability Funding Ratio (A1/A2)	29.43%	31.28%
5. Normal Cost	2,040,583 (13.47)*	2,225,452 (13.39)*
B. Contributions		
1. Chapter 356 Requirement	3,751,859 (24.77)	4,109,790 (24.73)
2. Actual Prescribed Contribution	611,230 (4.04)	674,704 (4.06)
C. Depth of Funding - Plan Continuation Basis		
1. Present Value of Accrued Benefits	\$52,625,229	\$57,539,992
2. Depth of Funding (A1/C1)	26.19%	27.78%

* Contribution level as a percentage of the valuation salaries.

REPORT HIGHLIGHTS (continued)

	<u>6/30/85</u>	<u>6/30/86</u>
D. Plan Participants		
1. Active Members		
a. Number	239	242
b. Valuation payroll	\$15,145,615	\$16,616,138
c. Average salary	63,371	68,662
2. Retired Members/Beneficiaries		
a. Number	139	138
b. Average annual benefit	\$ 16,136	\$ 17,594
3. Deferred Annuitants		
a. Number	8	8
b. Average annual vested benefit	\$ 18,810	\$ 19,276
4. Former Members Without Vested Rights		
a. Number	0	0
b. Average employee contributions	0	0

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

ACTUARIAL VALUATION AS OF JUNE 30, 1986

PURPOSE AND SUMMARY

The purpose of this report is to set forth the financial status of the Minnesota State Retirement System (MSRS) Judges' Retirement Fund in accordance with the applicable provisions set forth in Chapter 356 and Chapter 11A of the Minnesota Statutes.

Chapter 356 of the Minnesota Statutes sets forth the annual reporting requirements which govern the public employee retirement systems in Minnesota. The principal requirement (in addition to the experience study requirements) is that an actuarial valuation be performed each year and that the valuation specifically set forth the following items based on an assumed 8% pre-retirement and 5% post-retirement interest rate and a 6-1/2% salary scale assumption:

1. The assets of the plan and the present value of all benefits which will be payable from the plan.
2. The normal cost of the plan (as a level percentage of payroll) based on the entry age normal cost method.
3. The accrued liability of the plan, defined as the present value of all benefits less the present value of future entry age normal costs.
4. An actuarial balance sheet showing accrued assets, accrued liabilities, and the deficit from full funding of the accrued liability (unfunded accrued liability).
5. The annual contribution required to pay normal cost and amortize the June 30, 1986 unfunded accrued liability by June 30, 2009.
6. An analysis explaining the increase or decrease in the unfunded accrued liability since the last valuation.

Chapter 11A of the Minnesota Statutes pertains to the operation of the Minnesota Post Retirement Investment Fund (MPRI Fund). It includes requirements regarding the determination of the present value of benefits payable from the MPRI Fund (as of June 30, 1986 and as of January 1, 1987), and the corresponding mortality gain or loss each year, the latter to facilitate an appropriate transfer between the Judges' Retirement Fund and the MPRI Fund.

) This reporting on the status of the Judges' Retirement Fund as of June 30, 1986, is intended to comply with all of the requirements regarding actuarial reporting that are set forth in Chapters 356 and 11A of the Statutes. The Appendix at the end of the report cross-references the information of the Minnesota Statutes set forth herein with that specifically called for under Chapters 356 and 11A respectively.

VALUATION ASSETS

The Executive Director furnished us with a Financial Report setting forth the assets and liabilities of the Fund as of June 30, 1986. The Accounting Balance Sheet furnished by the Executive Director is set forth in Table 1.

ACTUARIAL BALANCE SHEETS

Table 2 sets forth an Actuarial Balance Sheet summarizing the actuarial valuation. Whereas the previously mentioned Accounting Balance Sheet (Table 1) balances the current assets to date with current accumulated reserves for benefits payable, the Actuarial Balance Sheet compares total assets, including the present value of all future contributions payable to the plan, with the present value of all benefits payable from the plan.

) Table 3(a) sets forth a balance sheet comparing the assets and unfunded accrued liability (the total of the two equaling the accrued liability) to the current liabilities and reserves required under the plan. This table is in the format specifically required by Chapter 356 and is supported by Table 3(b) which sets forth the determination of the unfunded accrued liability as of June 30, 1986. The status of the MPRI fund as of June 30, 1986 was provided by The Wyatt Company, in their role as actuary for the Legislative Commission on Pensions and Retirement.

Table 1

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Accounting Balance Sheet as of June 30, 1986

A. ASSETS

1. Cash	\$ 23,103
2. Short term investments (at cost)	1,352,447
3. Accrued Judges' contributions	6,227
4. Accrued Contributions	400
5. Interest receivable	7,506
6. Investment in debt securities (actuarial value)****	1,106,477
7. Due from Other Funds	33,229
8. Investment in equities (actuarial value)*	2,936,055
9. Participation in MPRI Fund**	10,620,000
TOTAL ASSETS	<u>\$16,085,444</u>

B. LIABILITIES AND RESERVES

Liabilities

1. Due SER Fund	\$ 31,801
2. Accounts Payable	
a. Annuitants	0
b. Accrued expenses	0
3. Deferred Revenue	70,969
4. Due to MPRIF	0
5. Total liabilities	<u>\$ 102,770</u>

Reserves

1. MPRI Fund Reserve	10,620,000
2. Member contribution reserve	3,670,387
3. Retirement Reserve - "Old Law" Judges	2,022,507
4. Retirement Reserve - Additional Judges and Survivors	9,142,865
5. State contribution reserve	(9,473,085)
6. Total reserves	<u>\$15,982,674</u>
7. Unrealized loss on equities	0
8. Valuation Assets***	<u>\$15,982,674</u>
9. TOTAL LIABILITIES AND RESERVES	<u>\$16,085,444</u>

* Market value as of June 30, 1986 is \$3,444,070 for equities.

** Participation equals Required Reserves for retired lives participating in the MPRI fund.

*** Portion of assets to be applied as valuation assets towards providing benefits.

**** The value at cost as of June 30, 1986 is \$1,106,277 for debt securities.

Table 2

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Actuarial Balance Sheet as of June 30, 1986

A. ASSETS

1. Assets on hand from accounting balance sheet:		
a. Participation in MPRI Fund	\$10,620,000	
b. All other assets	<u>5,465,444</u>	\$ 16,085,444
2. Present value of employees' future contributions		7,174,991
3. Present value of state future contributions*		<u>0</u>
4. TOTAL ASSETS		<u>\$23,260,435</u>

B. LIABILITIES

1. Current liabilities from accounting balance sheet		\$ 102,770
2. Present value of earned and earnable benefits payable to presently active members:		
a. Current benefit obligations	\$34,548,937	
b. Future benefit obligations	<u>15,353,207</u>	49,902,144
3. Present value of benefits for deferred annuitants		1,205,383
4. Present value of refundment to former members without vested rights		0
5. Present value of benefits for presently retired persons:		
a. Participation in MPRI Fund	\$10,620,000	
b. From Judges' Fund	<u>11,165,672</u>	<u>21,785,672</u>
6. TOTAL LIABILITIES		<u>\$72,995,969</u>

C. PROJECTED BENEFIT FUNDING RATIO (A/B) 31.9%

* No annual contributions are made by the State, except to "purchase" annuity benefits from MPRIF at retirement. The annuity purchases have not been included in this calculation.

Table 3(a)

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Chapter 356 Balance Sheet as of June 30, 1986

ASSETS AND UNFUNDED ACCRUED LIABILITY

A. ASSETS(1)

1. Cash	\$ 23,103
2. Short term investments (at cost)	1,352,447
3. Accounts receivable	
- accrued judges' contributions	6,227
- other contributions	400
4. Interest receivable	7,506
5. Investment in debt securities (actuarial value)	1,106,477
6. Due from Other Funds	33,229
7. Investment in equities (actuarial value)	2,936,055
8. Participation in MPRI Fund(2)	10,620,000
9. TOTAL ASSETS	<u>\$16,085,444</u>

B. UNFUNDED ACCRUED LIABILITY

1. Total unfunded accrued liability	35,119,259
2. TOTAL ASSETS AND UNFUNDED ACCRUED LIABILITY	<u>\$51,204,703</u>

CURRENT LIABILITIES AND RESERVES REQUIRED

C. LIABILITIES

1. Due SER Fund	\$ 31,801
2. Accounts Payable - annuitants	0
- accrued expenses	0
3. Deferred Revenue	70,969
4. Due to MPRI	0
5. TOTAL LIABILITIES	<u>\$102,770</u>

D. RESERVES REQUIRED

1. Total reserves required per attached Table 3(b)	51,101,933
2. TOTAL CURRENT LIABILITIES AND RESERVES REQUIRED	<u>\$51,204,703</u>

- (1) Accumulated contributions of members not yet retired amount-
ed to \$3,670,387 as of June 30, 1986 (includes accrued but
unpaid contributions).
- (2) Participation equals Required Reserves for retired lives par-
ticipating in the MPRI fund as of June 30, 1986, excluding
the January 1, 1987 benefit increases.

Table 3(b)

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Determination of Accrued Liability and
Unfunded Accrued Liability as of June 30, 1986

	Present Value of Benefits	Present Value of Applicable Portion of Normal Cost Contribution	Accrued Liability Equals Reserves Required (1) - (2)
A. DETERMINATION OF ACCRUED LIABILITY			
1. Active Members			
a. Retirement benefits	\$39,006,251	\$14,630,660	\$24,375,591
b. Disability benefits	3,407,653	2,192,756	1,214,897
c. Refundments due to death or withdrawal	-	-	-
d. Surviving spouse benefit	7,488,240	4,967,850	2,520,390
e. Subtotal	<u>49,902,144</u>	<u>21,791,266</u>	<u>28,110,878</u>
2. Deferred annuitants	1,205,383	-	1,205,383
3. Former members without vested rights	0	-	0
4. Retirement and survivors benefits from Judges' Fund	11,165,672	-	11,165,672
5. Participation in MPRI Fund	<u>10,620,000</u>	<u>-</u>	<u>10,620,000</u>
6. Total	<u>\$72,893,199</u>	<u>\$21,791,266</u>	<u>\$51,101,933</u>
B. DETERMINATION OF UNFUNDED ACCRUED LIABILITY			
1. Accrued Liability	-	-	\$51,101,933
2. Valuation assets	-	-	15,982,674
3. Unfunded accrued liability (1 - 2)	-	-	35,119,259

) CONTRIBUTIONS

Chapters 356 and 490 set forth requirements as to the level of contributions. Chapter 490 prescribes the actual amount of contributions and Chapter 356 describes the method used to determine the amount of contribution required to fully fund the Normal Cost and the Unfunded Accrued Liability. The calculations below use a payroll figure of \$16,616,138.

Annual Requirement in Accordance with Chapter 356:

	<u>Percent of Payroll</u>	<u>Amount</u>
1. Normal cost	13.39%	\$2,225,452
2. Assumed operating expense	.25	41,540
3. Amortization of the Unfunded Accrued Liability by June 30, 2009	11.09	1,842,798
4. Total Chapter 356 requirement (1 + 2 + 3)	24.73	4,109,790

DEPTH OF FUNDING

) The depth of funding is an indication of the extent to which the accrued benefits are funded and is measured by the ratio of valuation assets to the present value of accrued benefits. These measurements are made on the plan continuation basis (applying actuarial assumptions including assumed salary increases) and are illustrated as follows:

Depth of Funding:

1. Active members	\$34,548,937
2. Deferred annuitants	1,205,383
3. Former members without vested rights	0
4. Retirement and survivors' benefits not payable from MPRI Fund	11,165,672
5. Participation in MPRI Fund	<u>10,620,000</u>
6. Total present value of accrued benefits	\$57,539,992
7. Valuation assets	15,982,674
8. Depth of Funding (7/6)	27.78%

) MINNESOTA POST RETIREMENT INVESTMENT FUND

Background

The Minnesota Post Retirement Investment Fund (MPRI Fund), previously termed the Minnesota Adjustable Fixed Benefit Fund (MAFB), is basically a vehicle for providing variable annuity payments to pensioners. When an active participant retires, assets equal to the present value of future benefits payable to that participant (and beneficiary, if applicable) are transferred from the State and Employee Contribution Reserves, to the MPRI Fund. Thereafter, benefits are paid from the MPRI Fund. Future benefit increases are determined on the basis of the investment performance of MPRI Fund assets.

Chapter 11A of the Minnesota Statutes provides a method for determining benefit increases. A benefit increase is granted in any year in which the earnings of MPRI Fund assets exceed 5%. In a year in which there is an MPRI Fund deficit (i.e., required reserves exceed MPRI Fund assets), 5% of any income in excess of the 5% requirement is credited towards amortizing the deficit, with the remaining 95% being used to provide benefit increases. If there is no MPRI Fund deficit, all income in excess of the required 5% is used to provide benefit increases.

) MPRI Fund Status as of June 30, 1986

Table 4 sets forth the determination of MPRI Fund net assets and reserve requirements as of June 30, 1986.

This information was developed by The Wyatt Company, actuaries for the Legislative Commission on Pensions and Retirement, and is reprinted here without verification.

UNFUNDED ACCRUED LIABILITY

Tables 5 and 6 reconcile the change in the unfunded accrued liability during the year. Table 5 sets forth a demonstration that the increase in the unfunded accrued liability is equal to the excess of deductions over income during the year, where any increase in required actuarial reserves is indicated as a deduction item. Table 6 sets forth our analysis of the change in the unfunded accrued liability.

Table 4

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT PLAN

Actuarial Information for
Determining MPRI Fund Benefit Increase

	<u>Amount on 6/30/86</u>
1. Expected Reserves Assuming 5% Interest (MPRIF Participation Before Actuarial Gain or Loss)	\$10,652,993*
2. Required Reserves (MPRIF Participation After Actuarial Gain or Loss)	10,620,000**
3. Actuarial Gain (Loss) due to Mortality (1) - (2)	\$ 32,993

Required Reserves (line 2) Valued 1/1/87**

Members Eligible for Increase	\$ 9,239,000
Members Not Eligible for Increase	<u>1,230,000</u>
Total	\$ 10,469,000

* Information supplied by State Board of Investment.

** Information supplied by The Wyatt Company, actuaries for the
Legislative Commission on Pensions and Retirement.

Table 5

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Analysis of Income and Deductions From Income and
Effect on the Unfunded Accrued Liability

A. INCOME			
1.	From Judges' contributions		\$ 561,982
2.	From Employer contributions		2,172,794
3.	From investments		
	a. Investment income	549,783	
	b. Gain on sale of stock	53,958	
	c. Investment Expenses	<u>(6,143)</u>	597,598
4.	Participation in MPRI Fund income		1,057,134
5.	Other Revenues		81,175
6.	Unrealized Gains		<u>150,434</u>
7.	TOTAL INCOME		<u>\$ 4,621,117</u>
B. DEDUCTIONS FROM INCOME			
1.	Benefits		
	a. Judges' Plan service retirement annuities	1,836,988	
	b. Judges' Plan disability annuities	47,176	
	c. Judges' Plan survivor benefits (spouses) and other judges	<u>506,866</u>	2,391,030
2.	Refundments (employee contributions)		
	a. Refunds	0	
	b. Interest on refunds	<u>0</u>	0
3.	Administrative expenses		31,815
4.	Increase in total reserves required		
	a. Reserves required 6/30/85	46,842,898	
	b. Reserves required 6/30/86	<u>51,101,933</u>	<u>4,259,035</u>
5.	TOTAL DEDUCTIONS FROM INCOME		<u>\$ 6,681,880</u>
6.	EXCESS OF DEDUCTIONS FROM INCOME OVER INCOME		<u>\$ 2,060,763</u>
C. INCREASE IN UNFUNDED ACCRUED LIABILITY			
1.	Unfunded accrued liability 6/30/85		33,058,496
2.	Unfunded accrued liability 6/30/86		<u>35,119,259</u>
3.	INCREASE IN UNFUNDED ACCRUED LIABILITY		<u>\$ 2,060,763</u>

Table 6

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Analysis of Change in the Unfunded Accrued Liability
During the Fiscal Year Ending June 30, 1986

1. Unfunded accrued liability as of June 30, 1985		\$33,058,496
2. Change due to current rate of funding and interest requirements		
a. 8% interest requirement	2,644,680	
b. 1985-86 past service contribution	<u>688,873</u>	
c. Net addition: (a) - (b)		1,955,807
3. Change due to actuarial gains (indicated by parentheses) or losses (no parentheses) because of experience deviations from expected		
a. Salary	416,720	
b. Investment income	(457,652)	
c. MPRI Fund mortality	(32,993)	
d. Mortality on other retirees	195,895	
e. Social Security	17,664	
f. Withdrawals, death, disability of active members (balancing item)	<u>243,648</u>	383,282
4. Decrease in Unfunded Liability due to change in assumptions (see page 28)		<u>(278,326)</u>
5. Unfunded accrued liability as of June 30, 1986		<u>\$35,119,259</u>

) EMPLOYEE DATA

The Executive Director furnished us with employee information pertaining to all active members, inactive members and retired members of the Fund. Tables 7 and 8 summarize the changes in active, inactive and retired membership during the year in accordance with the requirements set forth in Section 356.215 of the Minnesota Statutes, Subdivisions 4 and 5. In addition, age and service, salary and benefit distributions are provided in Tables 9(a) and 9(b) for active employees and 10(a) and 10(b) for retirees.

PLAN VALUED

The provisions of the Minnesota State Retirement System, Judges' Retirement Fund are governed principally by Chapters 490 and 11A of the Minnesota Statutes pertaining to MPRI Fund Benefits. Table 11 sets forth a summary of the principal provisions as of June 30, 1986. No significant changes to Chapter 490 were reported since the last actuarial valuation as of June 30, 1985.

)

Table 7

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Covered Judges' Retirement Fund Employee Census Data
as of June 30, 1986

	<u>Number</u>	<u>Annual Payroll</u>
Active at June 30, 1985	237*	\$15,015,615
New Entrants	<u>10</u>	
Total	247	
Less Separations from Active Service:		
Inactive Vested	1	62,920
Service Retirement	5	316,800
Death while eligible, Spouse Receiving Annuity	<u>1</u>	0
Total Separations	7	
Active at June 30, 1986	240*	16,160,334

Average Entry Age of New Employees

<u>For the Fiscal Year</u> <u>Ending</u>	<u>Average Age</u> <u>at Entry</u>
6/30/82	41.3
6/30/83	41.0
6/30/84	43.7
6/30/85	34.2
6/30/86	47.2

Average age at entry in State service for all active employees at 6/30/86:

Male	41.4
Female	41.7
Total	41.7

* Not including Supreme Court Justices.

Table 8

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Judges' Retirement Fund Annuitant Census Data
as of June 30, 1986

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
A. <u>Service Retirement Annuitants</u>		
Receiving at June 30, 1985	83	\$1,650,044.28
New	5	114,650.76
Deaths	(5)	(131,391.69)
Adjustments-Net Result	<u>0</u>	<u>155,003.97</u>
Receiving at June 30, 1986	83	1,788,307.32
B. <u>Disabled Employees</u>		
Receiving at June 30, 1985	4	78,674.48
New	1	18,181.92
Adjustments-Net Result	<u>0</u>	<u>4,889.20</u>
Receiving at June 30, 1986	5	101,745.60
C. <u>Widows Receiving an Annuity or Survivor Benefit</u>		
Receiving at June 30, 1985	52	514,179.36
New	2	14,589.24
Deaths	(4)	(29,635.08)
Adjustments-Net Result	<u>0</u>	<u>38,751.26</u>
Receiving at June 30, 1986	50	537,884.78
D. <u>Children Receiving a Survivor Benefit</u>		
Receiving at June 30, 1986	None	

Table 8 (continued)

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
E. <u>Deferred Annuitants</u>		
Deferred as of June 30, 1985	8	\$150,478.20
New	1	21,912.00
Adjustments	<u>(1)</u>	<u>(18,181.92)</u>
Deferred as of June 30, 1985	8	\$154,208.28

Average Age at Retirement of New Service Annuitants*

<u>Fiscal Year Ending</u>	<u>Average Retirement Age</u>
6/30/82	65.2
6/30/83	67.7
6/30/84	69.2
6/30/85	68.0
6/30/86	69.1
All Existing Service Annuitants	68.2

* Not including District or Supreme Court, or County Paid Judges or Widows.

Table 9(a)

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND
Active Judges

Employee Age and Service Distribution

Age Group	Service Group							Total
	<u>0-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-30</u>	<u>30+</u>	
<u>Male</u>								
0 - 19								0
20 - 24								0
25 - 29								0
30 - 34								0
35 - 39	14							14
40 - 44	18	8	4					30
45 - 49	9	11	11	2				33
50 - 54	4	8	8	6	1			27
55 - 59	1	8	17	5	6	2	2	41
60 - 64	4	4	11	12	9	11	2	53
65 - 69	1	1	7	5	3	2	2	21
70 - 74	0	0	0	0	1	0	0	1
75 - 79	0	0	0	0	0	0	0	0
79 - 84	0	0	0	0	0	0	0	0
85+	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	51	40	58	30	20	15	6	220

Female

0 - 19								0
20 - 24								0
25 - 29								0
30 - 34	1							1
35 - 39	6	1						7
40 - 44	3	1						4
45 - 49	1	1						2
50 - 54	1	1	1	1				4
55 - 59	1	1	0	0				2
60 - 64	1	1	0	0				2
65 - 69	0	0	0	0				0
70 - 74	0	0	0	0				0
75 - 79	0	0	0	0				0
80 - 84	0	0	0	0				0
85+	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	14	6	1	1	0	0	0	22

Table 9(b)

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND
Active Judges

Employee Salary Distribution

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0 - 19	0	\$ 0	\$ 0	0	\$ 0	\$ 0	0	\$ 0	\$ 0
20 - 24	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	1	68,350	68,350	1	68,350	68,350
35 - 39	14	956,900	68,350	7	467,843	66,835	21	1,424,743	67,845
40 - 44	30	2,050,500	68,350	4	276,337	69,084	34	2,326,837	68,436
45 - 49	33	2,261,424	68,528	2	136,700	68,350	35	2,398,124	68,518
50 - 54	27	1,845,450	68,350	4	276,337	69,084	31	2,121,787	68,445
55 - 59	41	2,795,362	68,180	2	149,567	74,784	43	2,944,929	68,487
60 - 64	53	3,648,159	68,833	2	146,630	73,315	55	3,794,789	68,851
65 - 69	21	1,468,229	69,916	0	0	0	21	1,468,229	69,916
70 - 74	1	68,350	68,350	0	0	0	1	68,350	68,350
75 - 79	0	0	0	0	0	0	0	0	0
80 - 84	0	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0	0
Total	220	\$15,094,374	\$68,611	22	\$1,521,764	\$69,171	242	\$16,616,138	\$68,662

Distribution of Annual Earnings By Service Groups

Service Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	8	\$ 546,800	\$68,350	1	\$ 68,350	\$68,350	9	\$ 615,150	\$68,350
1	7	478,450	68,350	2	136,700	68,350	9	615,150	68,350
2	13	904,316	69,563	6	410,100	68,350	19	1,314,416	69,180
3	17	1,161,950	68,350	4	272,723	68,181	21	1,434,673	68,318
4	6	404,694	67,449	1	68,350	68,350	7	473,044	67,578
0 - 4	51	3,496,210	68,553	14	956,223	68,302	65	4,452,433	68,499
5 - 9	40	2,743,929	68,598	6	425,904	70,984	46	3,169,833	68,909
10 - 14	58	3,968,124	68,416	1	68,350	68,350	59	4,036,474	68,415
15 - 19	30	2,068,309	68,944	1	71,287	71,287	31	2,139,596	69,019
20 - 24	20	1,372,874	68,644	0	0	0	20	1,372,874	68,644
25 - 29	15	1,029,066	68,604	0	0	0	15	1,029,066	68,604
30+	6	415,862	69,310	0	0	0	6	415,862	69,310
Total	220	\$15,094,374	\$68,611	22	\$1,521,764	\$69,171	242	\$16,616,138	\$68,662

Table 10(a)

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Annuitants in MPRIF*
(Includes Retired and Disabled)

Retiree Age Distribution

Age Group	Years Retired							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
<u>Male</u>								
Under 40	0							0
40 - 44	0							0
45 - 49	0							0
50 - 54	0							0
55 - 59	0							0
60 - 64	0							0
65 - 69	8	1						9
70 - 74	16	10	1					27
75 - 79	1	10	2					13
80 - 84	0	4	2					6
85 & over	<u>0</u>	<u>0</u>	<u>2</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>2</u>
Total	25	25	7	0	0	0	0	57
<u>Female</u>								
Under 40	0							0
40 - 44	0							0
45 - 49	0							0
50 - 54	0							0
55 - 59	0							0
60 - 64	0							0
65 - 69	1							1
70 - 74	0							0
75 - 79	0	1	1					2
80 - 84	0	0	0					0
85 & over	<u>0</u>	<u>0</u>	<u>0</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>0</u>
Total	1	1	1	0	0	0	0	3

*Only includes Judges retired after January 1, 1974.

Table 10(b)

MINNESOTA STATE RETIREMENT SYSTEM

Annuitants in MPRIF
(Includes Retired and Disabled)

Distribution of Annual Benefits by Age Groups

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
Under 50	0	\$ 0	\$ 0	0	\$ 0	\$ 0	0	\$ 0	\$ 0
50 - 54	0	0	0	0	0	0	0	0	0
55 - 59	0	0	0	0	0	0	0	0	0
60 - 64	0	0	0	0	0	0	0	0	0
65 - 69	9	186,491	20,721	1	22,385	22,385	10	208,876	20,888
70 - 74	27	630,934	23,368	0	0	0	27	630,934	23,368
75 - 79	13	202,377	15,567	2	21,601	10,801	15	223,978	14,932
80 - 84	6	136,261	22,710	0	0	0	6	136,261	22,710
85+	2	44,877	22,439	0	0	0	2	44,877	22,439
Total	57	\$1,200,940	\$21,069	3	\$43,986	\$14,662	60	\$1,244,926	\$20,749

Distribution of Annual Benefits By Years Retired

Years Retired	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	5	\$ 131,392	\$26,278	0	\$ 0	\$ 0	5	\$ 131,392	\$26,278
1	9	208,578	23,175	0	0	0	9	208,578	23,175
2	1	5,376	5,376	0	0	0	1	5,376	5,376
3	8	191,953	23,994	0	0	0	8	191,953	23,994
4	2	53,774	26,887	1	22,385	22,385	3	76,159	25,386
0 - 4	25	591,072	23,643	1	22,385	22,385	26	613,457	23,595
5 - 9	25	477,019	19,081	1	9,252	9,252	26	486,271	18,703
10 - 14	7	132,849	18,978	1	12,349	12,349	8	145,198	18,150
15 - 19	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0
30+	0	0	0	0	0	0	0	0	0
Total	57	\$1,200,940	\$21,069	3	\$43,986	\$14,662	60	\$1,244,926	\$20,749

Table 11

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Summary of Principal Plan Provisions as of June 30, 1986

A. JUDGES' PLAN

1. Coverage: From first date as a Judge.
2. Types of Coverage:
 - a. Including Social Security: All Judges except those excluded by Item 2(b) are covered by Social Security.
 - b. Not Including Social Security: Judges prior to January 1, 1974 were given the opportunity to elect not to be covered under Social Security.
3. Contributions:
 - a. From Judges: Judges pay the Social Security Tax Rate applied to the entire salary, plus an additional 1/2% of salary. For those Judges with Social Security coverage, the appropriate portion of this contribution is forwarded to Social Security.
 - b. From the State: The State provides any additional funds necessary to meet obligations, as Judges retire.
4. Final Average Salary: Monthly average for the highest 5 years of salary within the last 10 years.
5. Normal Retirement:
 - a. Eligibility: Earlier of:
 - attainment of age 65 and completion of 10 years of service; or
 - attainment of age 70.

Table 11 (continued)

- b. Benefit Amount: 2-1/2% of Final Average Salary for each year of service prior to June 30, 1980, plus 3% of Final Average Salary for each year thereafter.
 - c. Maximum Benefit: 65% of annual salary in the year immediately preceding retirement.
- 6. Early Retirement:
 - a. Eligibility: Attainment of age 62 and completion of 10 years of service.
 - b. Benefit Amount: Normal Retirement benefit formula based on service and Final Average Salary to date of early retirement but reduced 1/2% for each month that actual retirement precedes age 65.
- 7. Form of Payment: Life annuity with no guarantees upon death. Joint & Survivor options are available.
- 8. Disability Retirement:
 - a. Eligibility: None other than disablement while in office.
 - b. Benefit Amount:
 - Full salary for the first two years of disability paid outside the plan.
 - After two years of disability, an annuity computed in the same manner as the full benefit amount for service retirement, subject to a minimum of 25% of Final Average Salary.

Table 11 (continued)

9. Deferred Service Retirement: Any annuity benefit described above may be deferred until the early or normal retirement date.
10. Return of Contributions: Upon termination of employment, if a Judge qualifies for no other benefits under this plan, he will receive his contributions accumulated with interest at a rate of 5% compounded annually.
11. Pre-Retirement Survivor's Annuity: 60% of the annuity determined in the same manner as normal service retirement benefits assuming the Judge retired on his date of death. Subject to minimum of 25% of Final Average Salary.
12. Post-Retirement Survivor's Annuity:
 - a. Joint and Survivor Election: In lieu of receiving benefits in the standard life annuity form of payment, a retiring Judge may elect actuarially reduced benefits in the joint and survivor annuity form.
 - b. Prior Survivor's Benefits: Benefits for Judges who were in office prior to January 1, 1974 and who continue to make additional contributions of 4% of salary receive benefits in the 50% joint and survivor form, with no actuarial reduction.
13. Social Security Offset: For Judges participating in Social Security, Judges' Plan benefits are reduced by 75% of the primary Social Security benefit payable.

Table 11 (continued)

B. SUPREME COURT JUSTICES' PLAN

1. Coverage: Supreme Court Justices as of December 31, 1973 who elected coverage under Chapter 490.025 in lieu of coverage under Chapters 490.121 through 490.132.
2. Retirement With Continuation of Compensation:
 - a. Eligibility: Attainment of age 70 and completion of 12 years of Supreme Court service, or 15 years of service as Supreme Court Judge and Judge of District Court.
 - b. Benefit Amount: Continuation of final compensation until the end of the term to which the Supreme Court Justice was elected.

50% of final salary plus an additional 2-1/2% of final salary for each year of Supreme Court service in excess of 12, except for service after age 73, payable after the continuation of compensation ceases. The maximum benefit is 75% of final salary.
3. Retirement Without Continuation of Compensation:
 - a. Eligibility: Earlier of:
 - attainment of age 65 and completion of 12 years of Supreme Court service; or
 - attainment of age 70 and completion of two full terms.
 - b. Benefit Amount: 50% of final salary plus an additional 2-1/2% of final salary for each year of Supreme Court service in excess of 12.

) Table 11 (continued)

4. Disability Benefits:

a. Eligibility: Disablement after completion of two full terms.

b. Benefit Amount: 50% of final salary plus an additional 2-1/2% of final salary for each year of Supreme Court service in excess of 12.

5. Contributions from Judges:

4% of salary to provide a 50% joint and survivor benefit with no actuarial reduction.

) ACTUARIAL METHODS AND ASSUMPTIONS

Chapter 356 of the Minnesota Statutes calls for the determination of normal cost and accrued liability in accordance with the entry age normal cost method, one of several available projected cost methods. For the June 30, 1986 valuation, we used the individual entry age normal method, with salary scale.

The unfunded liability is amortized by the level percent of payroll method. (Each amortization payment is calculated as if the following year's payment will increase by 6.5%).

Tables 12(a), (b) and (c) summarize the actuarial assumptions used for this valuation. The only change in assumptions since the previous valuation is in the expected cost of the modified cash refund annuity. In prior years, the cost was estimated to equal 2% of the accrued liability for actives. This year, the 2% was decreased to 1%.

)

Table 12(a)

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Summary of Actuarial Assumptions and Methods

A. JUDGES' RETIREMENT FUND

1. Mortality: 1971 Group Annuity Mortality Table with ages set back 8 years for females.
2. Withdrawal: None.
3. Disability: Graded rates based on actual experience, as adjusted by the June 30, 1979 experience analysis and as set forth in the Separation From Active Service Table.
4. Expenses: Prior year expenses expressed as a percentage of prior year's payroll.
5. Interest Rate: 8% per annum pre-retirement, 5% per annum post-retirement.
6. Salary Scale: 6-1/2% per annum, disregarding actual salary history. Benefits in excess of IRC Sec. 415 limits caused by salary increases are disregarded.
7. Assumed Retirement Age: Later of age 68 or one year hence.
8. Actuarial Cost Method: Entry age cost method, with normal cost determined as a level percentage of future payroll on an individual basis.
9. Social Security:
 - a. Primary amount: Maximum current primary amount (\$760.10 per month for 1986), increasing with salary scale.
 - b. Level contribution rate: 7.15% assumed for all future years.

Table 12(a) (continued)

- c. Covered annual wages: Current annual wage base (\$42,000 for 1986), increasing with salary scale.
- B. SUPREME COURT JUSTICES
1. Mortality (Pre- and Post-Retirement): 1971 Group Annuity Mortality with ages set back 8 years for females.
 2. Withdrawal: None.
 3. Interest Rate: 8% pre-retirement, 5% post-retirement.
 4. Salary Scale: 6-1/2% per annum, disregarding actual salary history. Benefits in excess of IRC Sec. 415 limits caused by salary increases are disregarded.
 5. Expenses: Prior year expenses expressed as a percentage of prior year's payroll.
 6. Retirement Age: Latest of:
 - attainment of age 70;
 - completion of 12 years of service; or
 - one year from valuation date.

Table 12(b)

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Male Judges

Probabilities of Separation From Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>	<u>Age</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	5			45	29	3	
21	5			46	33	5	
22	5			47	38	7	
23	6			48	42	9	
24	6			49	47	11	
25	6			50	53	14	
26	7			51	59	16	
27	7			52	65	20	
28	7			53	71	24	
29	8			54	78	28	
30	8	2		55	85	34	
31	9	2		56	93	40	
32	9	2		57	100	46	
33	10	2		58	109	56	
34	10	2		59	119	66	
35	11	2		60	131	76	
36	12	2		61	144	90	
37	13	2		62	159	110	
38	14	2		63	174	136	
39	15	2		64	192	174	
40	16	2		65	213		
41	18	2		66	236		
42	20	2		67	263		
43	23	3		68			
44	26	3					10,000

Table 12(c)

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Female Judges

Probabilities of Separation From Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>	<u>Age</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	4			45	13	5	
21	4			46	14	6	
22	4			47	15	7	
23	4			48	16	7	
24	4			49	18	10	
25	5			50	20	10	
26	5			51	23	12	
27	5			52	26	14	
28	5			53	29	16	
29	5			54	33	20	
30	5			55	38	24	
31	6			56	42	30	
32	6			57	47	36	
33	6			58	53	44	
34	7			59	59	52	
35	7	1		60	65	62	
36	7	1		61	71	74	
37	8	1		62	78	88	
38	8	1		63	85	104	
39	9	2		64	93	122	
40	9	2		65	100		
41	10	2		66	109		
42	10	4		67	119		
43	11	4		68	131		
44	12	4					10,000

APPENDIX

MINNESOTA STATE RETIREMENT SYSTEM
JUDGES' RETIREMENT FUND

Table References to Chapter 356 and Chapter 11A*

<u>Table Number</u>	<u>Description**</u>	<u>References</u>
1	Accounting Balance Sheet	
2	Actuarial Balance Sheet	
3(a)	Chapter 356 Balance Sheet	356.20 Subd. 4(1) 356.215 Subd. 4(2)
3(b)	Determination of Accrued Liability and Unfunded Accrued Liability	356.215 Subd. 4(6) 356.215 Subd. 4(8) 11A.18 Subd.(9),(11)
4	Actuarial Information for Determining MPRI Fund Benefit Increase	
5	Analysis of Income and Deductions From Income and Effect on the Unfunded Accrued Liability	356.20 Subd. 4(2) 356.20 Subd. 4(3) 356.215 Subd. 4(11)
6	Analysis of Change in the Unfunded Accrued Liability During the Fiscal Year Ending June 30, 1986	356.215 Subd. 4(9)
7	Covered Judges' Retirement Fund Employee Census Data	
8	Judges' Retirement Fund Annuitant Census Data	356.20 Subd. 4(4) 356.215 Subd. 4(10)
9(a)	Employee Age and Service Distribution	
9(b)	Employee Salary Distribution	
10(a)	Retiree Age Distribution	
10(b)	Distribution of Annual Benefit by Age Group	
11	Summary of Principal Plan Provisions	356.215 Subd. 4(12)
12(a)	Summary of Actuarial Assumptions and Methods	
12(b)	Probabilities of Separation from Active Service - Male Judges	356.215 Subd. 4(4) 356.215 Subd. 4(5)
12(c)	Probabilities of Separation from Active Service - Female Judges	

* Chapter 356 and 11A of the Minnesota Statutes.

** All as of June 30, 1986.

MINNESOTA STATE RETIREMENT SYSTEM

LEGISLATORS' RETIREMENT FUND

ACTUARIAL VALUATION AS OF

JUNE 30, 1986

Board of Directors
Minnesota State Retirement System
529 Jackson at 10th Street
St. Paul, Minnesota 55101

RE: Legislators' Retirement Fund

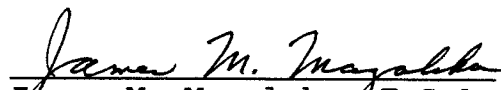
Ladies and Gentlemen:


We show in this report the results of the actuarial valuation of the Minnesota State Retirement System, Legislators' Retirement Fund as of June 30, 1986. This valuation included only the retired legislators participating in the Minnesota Post-Retirement Investment Fund. It was prepared by The Wyatt Company, actuaries for the Legislative Commission on Pensions and Retirement, and we inspected the figures for reasonableness.

The Wyatt Company indicated that this valuation was based on the 5% interest assumption mandated by Chapter 356 of the Minnesota Statutes, and the 1971 Group Annuity Mortality Table for males with ages set back eight years for females.

Respectfully submitted,

TOUCHE ROSS & CO.


James M. Magalska, F.S.A.


James F. Verlautz, F.S.A.

LEGISLATORS' RETIREMENT FUND

Actuarial Information for
Determining MPRI Fund Benefit Increase

	Amount on <u>6/30/86</u>
1. Expected Reserves Assuming 5% Interest (MPRIF Participation Before Actuarial Gain or Loss)	\$6,791,879*
2. Required Reserves (MPRIF Participation After Actuarial Gain or Loss)	6,950,000**
3. Actuarial Gain (Loss) due to Mortality (1) - (2)	(158,121)

Required Reserves (line 2) Valued 1/1/87**

Members Eligible for Increase	\$ 6,234,000
Members Not Eligible for Increase	<u>593,000</u>
Total	\$ 6,827,000

* Information supplied by State Board of Investment.

** Information supplied by The Wyatt Company and reprinted here.

MINNESOTA STATE RETIREMENT SYSTEM
LEGISLATORS' RETIREMENT PLAN

Legislators' Retirement Plan Annuitant Census Data
As of June 30, 1986

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
A. <u>Service Retirement Annuitants</u>		
Receiving at June 30, 1985	108	\$ 709,347.48
New	9	69,324.00
Deaths	(3)	(20,698.44)
Adjustments - net result	<u>1</u>	<u>58,004.16</u>
Receiving at June 30, 1986	115	\$ 815,977.20
B. <u>Disabled Employees</u>		
Receiving at June 30, 1986	None	
C. <u>Widows Receiving an Annuity or Survivor Benefit</u>		
Receiving at June 30, 1985	32	\$ 88,230.48
New	3	10,798.32
Deaths	(3)	(11,334.24)
Adjustments - net result	<u>0</u>	<u>6,023.04</u>
Receiving at June 30, 1986	32	\$ 93,717.60
D. <u>Children Receiving a Survivor Benefit</u>		
Receiving at June 30, 1985	9	\$ 11,674.68
New	0	0.00
Benefits terminated	0	0.00
Adjustments - net result	<u>0</u>	<u>920.40</u>
Receiving at June 30, 1986	9	\$ 12,595.08

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
E. <u>Deferred Annuities</u>		
Deferred as of June 30, 1985	111	\$ 819,067.80
New	1	22,879.44
Began receiving	(10)	(41,628.00)
Adjustments	<u>(1)</u>	<u>0.00</u>
Deferred as of June 30, 1986	101	\$ 800,319.24

Average Age at Retirement of New Service Annuitants

<u>Fiscal Year Ending</u>	<u>Average Retirement Age</u>
6/30/86	60.7
All Existing Service Annuitants	62.0 years

Table 1(a)

MINNESOTA STATE RETIREMENT SYSTEM
LEGISLATORS' RETIREMENT FUND

Retired Annuitants in MPRIF

Distribution of Annual Earnings by Age Groups

Age Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0 - 19	0	\$ 0	\$ 0	0	\$ 0	\$ 0	0	\$ 0	\$ 0
20 - 24	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0
35 - 39	0	0	0	0	0	0	0	0	0
40 - 44	0	0	0	0	0	0	0	0	0
45 - 49	0	0	0	0	0	0	0	0	0
50 - 54	0	0	0	0	0	0	0	0	0
55 - 59	0	0	0	0	0	0	0	0	0
60 - 64	30	196,858	6,562	0	0	0	30	196,858	6,562
65 - 69	30	266,353	8,878	0	0	0	30	266,353	8,878
70 - 74	25	170,442	6,818	0	0	0	25	170,442	6,818
75 - 79	14	78,629	5,616	0	0	0	14	78,629	5,616
80 - 84	13	86,722	6,671	0	0	0	13	86,722	6,671
85+	3	16,974	5,658	0	0	0	3	16,974	5,658
Total	115	\$815,978	\$7,095	0	\$ 0	\$ 0	115	\$815,978	\$7,095

TABLE B

Distribution of Annual Earnings by Service Groups

Service Group	Male			Female			All		
	No.	Total	Average	No.	Total	Average	No.	Total	Average
0	7	\$ 54,343	\$7,763	0	\$ 0	\$ 0	7	\$ 54,343	\$7,763
1	10	68,152	6,815	0	0	0	10	68,152	6,815
2	8	52,196	6,525	0	0	0	8	52,196	6,525
3	14	97,482	6,963	0	0	0	14	97,482	6,963
4	8	58,235	7,279	0	0	0	8	58,235	7,279
0 - 4	47	330,408	7,030	0	0	0	47	330,408	7,030
5 - 9	32	282,262	8,821	0	0	0	32	282,262	8,821
10 - 14	27	157,813	5,845	0	0	0	27	157,813	5,845
15 - 19	9	45,495	5,055	0	0	0	9	45,495	5,055
20 - 24	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0
30+	0	0	0	0	0	0	0	0	0
Total	115	\$815,978	\$7,095	0	\$ 0	\$ 0	115	\$815,978	\$7,095

Table 1(b)

MINNESOTA STATE RETIREMENT SYSTEM
LEGISLATORS' RETIREMENT FUND

Retired Annuitants in MPRIF

Distribution of Years Retired by Age Groups

Age Group	Service Group						Total
	0-4	5-9	10-14	15-19	20-24	25 & over	
<u>Male</u>							
Under 40							0
40 - 44							0
45 - 49							0
50 - 54							0
55 - 59							0
60 - 64	30						30
65 - 69	13	17					30
70 - 74	3	11	11				25
75 - 79	0	4	10				14
80 - 84	1	0	6	6			13
85 & over	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
Total	47	32	27	9	0	0	115
<u>Female</u>							
Under 40							0
40 - 44							0
45 - 49							0
50 - 54							0
55 - 59							0
60 - 64							0
65 - 69							0
70 - 74							0
75 - 79							0
80 - 84							0
85 & over	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	0	0	0	0	0	0	0