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REPORT ON
ACTUARIAL VALUATION
MINNESOTA STATE RETIREMENT SYSTEM

JUNE 30, 1976



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TOWERS, PERRIN, FORSTER & CROSBY
ONE CENTURY PLAZA
LOS ANGELES, CALIFORNIA 90067
(213)553-3470

November 9, 1976

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

Gentlemen:

We are pleased to transmit herewith our report on the actuarial valuation of your Retirement System made as of June 30, 1976.

Pursuant to the Contract under which this valuation was authorized, the actuarial valuation was carried out on the basis of a 5% interest rate assumption, a 3-1/2% salary scale, and on the basis of certain other specified actuarial assumptions. Also, in accordance with the above noted contract, we utilized the entry age normal cost method of funding to determine the unfunded supplemental present value (unfunded accrued liability) of the System.

We hereby certify that the actuarial valuation of the Minnesota State Retirement System made as of June 30, 1976 was carried out on the basis of accepted actuarial methods and procedures and in accordance with the provisions of Minnesota Statutes, Chapter 356. The results of that valuation indicate that the contributions required from the employees and from the State under Minnesota Statutes, Chapter 352, are adequate to provide the benefits that will be paid from the System.

We look forward to the opportunity of discussing this report with you at your convenience.

Very truly yours,

TOWERS, PERRIN, FORSTER & CROSBY


Harry M. Church

REPORT ON
ACTUARIAL VALUATION
OF THE
MINNESOTA STATE RETIREMENT SYSTEM
AS OF
JUNE 30, 1976

SECTION I
INTRODUCTION

In accordance with the Contract between the State of Minnesota and this firm, we have completed the actuarial valuation of the Minnesota State Retirement System as of June 30, 1976 as it was constituted as of that date.

The Executive Director of the System furnished us with detailed employee information on all active members, inactive members and retired members of the System as of June 30, 1976. The Executive Director and his staff are to be complimented on the accuracy and completeness of the aforementioned data.

The Executive Director also furnished us with a Financial Report setting forth the assets and liabilities of the Fund as of June 30, 1976. No physical audit of these assets was made by us and our calculations are based upon the Financial Report as submitted.

The Society of Actuaries recently recommended that the term "Unfunded Supplemental Present Value" replace the often used, in the past, term "Unfunded Accrued Liability". We are in full agreement with this recommendation and have used the term "Unfunded Supplemental Present Value" throughout this report.

) The following Section II sets forth the results of the actuarial valuation and Section III contains the exhibits required by Chapter 356 of the Statutes. The schedules attached at the end of the report show the actuarial assumptions used in the current valuation which were developed during the course of the actuarial investigation carried out as of June 30, 1975.

SECTION II

RESULTS OF ACTUARIAL VALUATION

The Contract under which this valuation was authorized specifies that the actuarial valuation be carried out on the basis of a 5% interest rate assumption, a 3-1/2% salary scale, the 1951 Group Annuity Mortality Table with ages set back one year for Male retirees and set back two years for Female retirees, and upon other appropriate actuarial assumptions. We were also instructed to carry out the actuarial valuation on the basis of an entry age normal cost method of funding.

The current valuation was carried out in accordance with the stipulations contained in the aforementioned Contract and on the basis of the other actuarial assumptions developed by the June 30, 1975 experience study. Also, we reflected the 1.72% average salary increase that became effective subsequent to June 30, 1976.

The entry age normal cost method of funding requires the determination of the level contribution rate which, if contributed on behalf of all new employees from the dates of employment to the dates of separation from service, will be adequate to provide all of their benefits. Under this funding method, the unfunded supplemental present value is taken as the total liability of the System for benefits earned in the past as well as those earnable in the future, less the assets on hand, less the present value of future employee contributions and less the present value of future State entry age normal cost contributions.

In order to develop the entry age normal cost contribution rate for new

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Correctional Employees, we carried out a complete valuation of active members as of June 30, 1976 who were employed during the preceding five-year period. The results of these calculations indicate that the total entry age normal cost rate for Correctional Employees amounts to 10.78% of salary. Correctional Employees are required by law to contribute 6% and, accordingly, the State's share of the entry age normal cost contribution rate for Correctional Employees amounts to 4.78%.

For General Employees, we carried out a complete valuation of all active members based on their ages at entry and upon their estimated salaries at time of entry. Based on this valuation, we calculated the total entry age normal cost rate to be 7.30%. General Employees are required by law to contribute 4% and, accordingly, the State's share of the entry age normal cost contribution for General Employees amounts to 3.30%.

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The law requires that the State make the following contributions to the fund:

1. A "matching contribution equal to 4% of General Employees' salaries and 9% of Correctional Employees' salaries.
2. An "additional" contribution equal to 2% of General Employees' salaries and 5% of Correctional Employees' salaries.

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We have been advised that it is the intent of the Minnesota Legislature to pay the "additional" contributions referred to above for a limited time only.

We assigned the State contribution Reserve to Correctional and General Employees in proportion to their accumulated contributions as follows:

State Contribution Reserve

General Employees	\$103,690,217
Correctional Employees	<u>3,270,213</u>
Total	\$106,960,430

The Accounting Balance Sheet shown on the following page was furnished by the Executive Director.

The Actuarial Balance Sheet shown on the page following the Accounting Balance Sheet summarizes the results of the valuation. In the current valuation we have made provision for administrative expenses amounting to .14% of salaries.

MINNESOTA STATE RETIREMENT SYSTEM

ACCOUNTING BALANCE SHEET
AS OF
JUNE 30, 1976

ASSETS

Cash in State Treasury	\$ 186,147.66
Cash in Bank	200.00
Short term investments (at cost)	14,998,545.28
Accounts receivable:	
(a) Accrued employee contributions	906,421.97
(b) Accrued employer contributions	1,388,068.95
(c) Employee back payments	150,141.35
(d) Investment maturities and sales	471,990.73
(e) Due from other plans	58,574.52
(f) Other	19,435.66
Accrued interest in investments	1,800,327.85
Dividends declared and payable but not yet received	22,685.44
Investment in debt securities at amortized cost	79,764,356.78
Investment in equities at cost (1)	80,227,501.82
Recognized unrealized appreciation in equities	1,244,233.33
Equipment at depreciated cost	13,035.23
Deferred yield adjustment account	2,586,736.25
Participation in the MAFB Fund	105,497,750.12
Total Assets	<u>\$289,336,152.94</u>

LIABILITIES AND RESERVES

LIABILITIES

Accounts payable:	
(a) Security purchases	\$ 432,500.50
(b) Annuities	1,381.74
(c) Due MAFB Fund	2,803.54
(d) Annuitant deposits	11,332.03
(e) Accrued expenses	47,836.50
(f) Overpaid dividends	1,785.00
(g) Transfer to unclassified employee retirement	335,341.59
Suspense item: Unredeemed 6 year old warrants	6,305.86
Total Liabilities	<u>\$ 839,286.76</u>

RESERVES

Employee contribution reserve	\$ 75,780,365.07
Survivor benefit reserve	258,321.00
Reserve for participation in MAFB Fund	105,497,750.12
State contribution reserve	106,960,429.99
Total Reserves	<u>\$288,496,866.18</u>
Total Liabilities and Reserves	<u>\$289,336,152.94</u>

(1) Market Value at June 30, 197⁶ was \$85,591,797.

MINNESOTA STATE RETIREMENT SYSTEM

ACTUARIAL BALANCE SHEET

AS OF

JUNE 30, 1976

ASSETS

1. Assets on Hand from Accounting Balance Sheet:		
a) Participation in MAFB Fund	\$105,497,750	
b) All other assets	<u>183,838,403</u>	\$289,336,153
2. Present Value of Employee's Future Contributions		151,276,141
3. Present Value of State Future Contributions Applicable to:		
a) Entry Age Normal Cost	\$124,663,210	
b) Unfunded Supplemental Present Value (Balance of "Matching" Contribution less .14% for Operating Expense)	23,839,388	
c) Unfunded Supplemental Present Value (Portion to be funded by "Additional" Contribution)	<u>153,583,766</u>	<u>302,086,364</u>
4. TOTAL ASSETS		<u>\$742,698,658</u>

LIABILITIES

5. Current Liabilities from Accounting Balance Sheet		\$ 839,287
6. Present Value of Earned and Earnable Benefits Payable to Presently Active Members:		
a) Retirement Benefits	\$497,021,552	
b) Disability Benefits	28,975,817	
c) Refundments due to death or withdrawal	86,063,321	
d) Surviving Spouse Benefits	<u>6,519,496</u>	618,580,186
7. Present Value of Benefits for Deferred Annuitants:		
a) Retirement Benefits	\$ 4,894,592	
b) Refundments due to death	<u>166,366</u>	5,060,958
8. Present Value of Refundments to former members without vested rights		425,415
9. Present Value of Survivor Benefits		236,109
10. Present Value of Benefits Payable from MAFB Fund		122,068,325
11. MAFBF Annuity Stabilization Account		(<u>4,511,622</u>)
12. TOTAL LIABILITIES		<u>\$742,698,658</u>

) The Actuarial Balance Sheet is a convenient device to present the results of an actuarial valuation. The following comments are intended to assist you in your understanding of the items contained in the Actuarial Balance Sheet.

Item 1 shows the assets on hand and was taken directly from the Accounting Balance Sheet.

Item 2 shows the present value of members' future contributions required by law.

Item 3 shows the present value of the State's future contributions to the System. We have divided the present value applicable to the State's contributions as follows:

) Item 3(a) The portion attributable to the State's share of the total entry age normal cost contribution of 3.30% of General Employees' salaries and 4.78% of Correctional Employees' salaries.

Item 3(b) The portion attributable to the balance of the State's "matching" contribution less .14% which is allocated for operating expenses. This amounts to .56% of General Employees' salaries and 4.08% of Correctional Employees' salaries.

) Item 3(c) The portion attributable to the State's "additional" contribution. The following table shows the required information for Correctional Employees and for General Employees:

	<u>Correctional Employees</u>	<u>General Employees</u>	<u>Total</u>
1. Annualized Salaries July 1, 1976	\$11,935,750	\$449,063,659	\$460,999,409
2. State "Additional" contribution rate	5%	2%	
3. Annual State "Additional" contribution	596,788	8,981,273	9,578,061
4. Item 3(c) Actuarial Balance Sheet	5,313,442	148,270,324	153,583,766
5. Years (to nearest year) required to amortize Item 3(c) of Actuarial Balance Sheet by "Addi- tional" State Contribu- tions which increase in accordance with salary scale	10	19	18
6. First year annual con- tribution with subsequent salary scale increases required to amortize Item 3(c) of Actuarial Balance Sheet over Period Ending June 30, 1997	294,634	8,221,685	8,516,319
7. Total Unfunded Supple- mental Present Value (Item 3(b) plus Item 3(c) of Actuarial Balance Sheet)	8,663,989	168,759,165	177,423,154

Item 5 shows the current liabilities and was taken directly from the Accounting Balance Sheet.

Item 6 shows the actuarially computed present value of all benefits earned to June 30, 1976 and earnable after that date that will be paid from the System to presently active members.

Item 7 shows the actuarially computed present value of all benefits payable from the System to members who have terminated service with vested benefits.

Item 8 shows the actuarially computed present value of refundments that will be paid from the System to members who have terminated service without vested benefits.

The total of \$122,068,325 shown for Item 10 represents the value of benefits payable from the MAFB to MSRS retirees. The Accounting Balance Sheet shows the MAFB Fund as \$105,497,750. The difference is due to the 1975-76 experience computed in accordance with the law as follows:

	<u>MAFB Fund</u>
1. Accounting Balance Sheet	\$105,497,750
2. Statutory Mortality Loss 1975-76	+ 12,058,953
3. Interest Loss 1975-76	<u>+ 4,511,622</u>
4. Actuarially Computed Reserve	\$122,068,325

We would like to note that the foregoing losses determined under the law are not precise values. The following schedule shows our determination of what we consider to be more appropriate gains and losses:

	<u>MAFB Fund</u>
1. Accounting Balance Sheet	\$105,497,750
2. Mortality Loss	+ 1,220,165
3. Balance of Loss	<u>+ 15,350,410</u>
4. Actuarially Computed Reserve	\$122,068,325

CONCLUSIONS

In a retirement system such as yours where both the benefits and contributions are specified in the Retirement Law, the major purpose of an actuarial valuation is to determine whether or not the prescribed contributions are adequate to provide the benefits that will ultimately be paid under the system. The results of the current valuation show that the benefits to be provided under the System can be financed by the members' contributions and the State's "matching" contributions plus the State's "additional" contribution for approximately eighteen years.

Based on the actuarial assumptions utilized for the current valuation, we estimate the present value of benefits earned to June 30, 1976 by presently active and retired persons to be \$364,346,844. Applicable assets, including \$4,511,622 due from the MAFB Fund, amount to \$293,847,775. Thus, as of June 30, 1976, 80.7% of the liability for benefits earned to date have been funded.

SECTION IV

REQUIRED EXHIBITS

Minnesota Statutes, Chapter 356, requires, in Section 356.20, Subdivision 4(1), that the actuary of the System prepare an exhibit setting forth certain specified information with regard to the System as of the valuation date, including "Reserves Required" under the System. In an earlier conference with representatives of the State's Employee Retirement System's Interim Commission, we were advised that "Reserve Required", as contemplated in the aforementioned statute, may be defined as the actuarially computed present value applicable to a specified benefit reduced by the actuarially computed present value of any portion of the total entry age normal cost contribution under the System which is applicable to the specified benefit.

The exhibit required by Section 356.20, Subdivision 4(1) of Minnesota Statutes, Chapter 356, is presented on the following pages of this Section IV and we hereby certify that the Reserves Required set forth therein have been computed in accordance with the Entry Age Normal Cost (level Normal Cost) basis in the manner outlined in the definition referred to above.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES CHAPTER 356,
SECTION 356.20, SUBDIVISION 4(1)
AS OF JUNE 30, 1976

ASSETS AND UNFUNDED SUPPLEMENTAL PRESENT VALUE

ASSETS

1. Cash in Office	\$.00
2. Cash in State Treasury	186,147.66
3. Cash in Bank	200.00
4. Short term investments (at cost)	14,998,545.28
5. Accounts Receivable:	
(a) Accrued employee contributions	906,421.97
(b) Accrued Employer contributions	1,388,068.95
(c) Employee back payments	150,141.35
(d) Investment maturities and sales	471,990.73
(e) Due from other plans	58,574.52
(f) Due from MAFB Fund	.00
(g) Other	19,435.66
6. Accrued interest in investments	1,800,327.85
7. Dividends declared and payable but not yet received	22,685.44
8. Investments in debt securities at amortized cost	79,764,356.78
9. Investment in equities at cost	80,227,501.82
10. Recognized unrealized appreciation in equities	1,244,233.33
11. Equipment at depreciated cost	13,035.23
12. Deferred yield adjustment account	2,586,736.25
13. Participation in the MAFB Fund	105,497,750.12
14. Total Assets	<u>\$289,336,152.94</u>

UNFUNDED SUPPLEMENTAL PRESENT VALUE

15. Unfunded Supplemental Present Value to be funded by portion of State's "Matching Contribution" in excess of State's share of entry age normal cost contribution and Operating Expenses	\$ 23,839,388.00
16. Unfunded Supplemental Present Value to be funded by State's "Additional" contribution	<u>\$153,583,765.82</u>
17. Total Unfunded Supplemental Present Value	\$177,423,153.82
18. TOTAL ASSETS AND UNFUNDED SUPPLEMENTAL PRESENT VALUE	<u>\$466,759,306.76</u>

CURRENT LIABILITIES AND RESERVES REQUIRED

CURRENT LIABILITIES

19. Accounts payable:	
(a) Security purchases	\$ 432,500.50
(b) Annuities	1,381.74
(c) Due MAFB Fund	2,803.54
(d) Annuitant deposits	11,332.03
(e) Accrued expenses	47,836.50
(f) Overpaid dividends	1,785.00
(g) Transfer to unclassified employee retirement	335,341.59
20. Suspense item: Unredeemed 6 year old warrants	6,305.86
21. MAFBF Annuity Stabilization Account	<u>(4,511,622.00)</u>
22. Total Liabilities	\$ (3,672,335.24)

RESERVES REQUIRED

23. Total Reserves Required per attached schedule	<u>\$470,431,642.00</u>
24. TOTAL CURRENT LIABILITIES AND RESERVES REQUIRED	<u>\$466,759,306.76</u>

NOTE: Accumulated contributions, without interest, of members not yet retired amounted to \$75,780,365.07 as of June 30, 1976.

MINNESOTA STATE RETIREMENT SYSTEM

DETERMINATION OF RESERVES REQUIRED
AS OF
JUNE 30, 1976

	(1)	(2)	(3)
	Present Value of Benefits	Present value of Applicable Portion of Normal Cost Contribution	Reserves Required (1) - (2)
<u>Benefits For:</u>			
1. Active Members:			
(a) Retirement Benefits	\$497,021,552	\$181,165,498	\$315,856,054
(b) Disability Benefits	28,975,817	19,140,322	9,835,495
(c) Refundments due to death or withdrawal	86,063,321	73,072,426	12,990,895
(d) Surviving Spouse Benefits	6,519,496	2,561,105	3,958,391
2. Deferred Annuitants	5,060,958	-	5,060,958
3. Former Members Without Vested Rights	425,415	-	425,415
4. Survivors	236,109	-	236,109
5. Benefits Payable from MAFB Fund	<u>122,068,325</u>	<u>-</u>	<u>122,068,325</u>
6. Total	\$746,370,993	\$275,939,351	\$470,431,642

) Minnesota Statutes, Chapter 356, requires, in Section 356.20, Subdivision 4(2) and (3), that there be submitted annually an analysis of the System's income and deductions from income with increases in total reserves required being specifically referred to as a deduction from income. The exhibit required by Section 356.20, Subdivision 4(2) and (3) is presented on the following page of this Section IV. Items of income and deductions from income with the exception of increases in total reserves required were taken directly from statements prepared by the Executive Director.

) Inasmuch as any excess of "income" over "deductions from income" must be equal to the reduction in the Unfunded Supplemental Present Value System over the period covered by the analysis, we have confirmed that fact in Item 16 of the exhibit.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES CHAPTER 356
SECTION 356.20, SUBDIVISION 4(2) AND (3)
FISCAL YEAR ENDING JUNE 30, 1976

ANALYSIS OF INCOME AND DEDUCTIONS FROM INCOME

INCOME

1. <u>From Employees</u>	
Employee contributions	\$16,576,796.28
Employee accrued contributions receivable	906,421.97
Employee contributions, accounts receivable	59,075.92
2. <u>From Employers</u>	
Employers contributions	16,925,668.75
Employer additional contributions	8,503,118.66
Employer accrued contributions receivable	1,388,068.95
3. <u>From Investments</u>	
Interest on debt securities and short term interest	5,935,525.42
Dividends on corporate stock	2,797,258.64
Recognized unrealized appreciation in stock	(902,189.44)
Premium on bonds called	8,429.47
Gain on sale of stock	54,956.58
Interest on back payments by employees	172,257.01
4. <u>From MAFB Fund Participation</u>	
Participation in MAFB Fund realized income	5,898,013.52
MAFB Fund statutory valuation adjustment	(6,425,903.58)
5. <u>Other Revenues</u>	
Miscellaneous	4,591.54
6. TOTAL INCOME	<u>\$51,902,089.69</u>

DEDUCTIONS FROM INCOME

7. Increase in MAFBF Annuity Stabilization Account		5,077,349.00
8. <u>Benefits</u>		
Service retirement annuities		12,982,774.07
Disability retirement benefits		510,945.73
Survivor benefits (spouses)		29,149.98
Lump sum annuity payments		267,850.00
9. <u>Refundments (Employee Contributions)</u>		
Left service		2,597,723.70
Employee deaths		241,606.80
Annuitant deaths		36,780.82
Erroneous deductions		28,347.02
Interest on contributions		126,311.80
10. <u>Unclassified Employee Retirement</u>		
Transfer of employee contributions		771,012.72
Transfer of employer contributions		1,031,670.01
Transfer of interest		49,272.86
11. <u>Operating Expenses</u>		
Total Operating Expenses		676,331.14
12. <u>Prior Year Adjustments</u>		.00
13. <u>Increase in Total Reserves Required</u>		
Reserves Required 6-30-75	\$448,492,206.00	
Reserves Required 6-30-76	<u>470,431,642.00</u>	<u>21,939,436.00</u>
14. TOTAL DEDUCTIONS FROM INCOME		\$46,366,561.65
15. EXCESS OF INCOME OVER DEDUCTIONS FROM INCOME		(5,535,528.04)
16. REDUCTION IN UNFUNDED SUPPLEMENTAL PRESENT VALUE:		
Unfunded Supplemental Present Value 6-30-75	\$182,958,681.86	
Unfunded Supplemental Present Value 6-30-76	<u>177,423,153.82</u>	\$ 5,535,528.04

) Minnesota Statutes, Chapter 356, requires, in Section 356.20, Subdivision 4(4), that there be submitted annually an analysis of changes in the membership of the System. Section 356.215. Subdivisions 4 and 5, requires information with respect to the annual payroll and annual annuities of the members of the System as well as certain information with respect to average ages, The exhibit required by Section 356.20, Subdivision 4 and Section 356.215, Subdivisions 4 and 5 is presented on the following pages of this Section IV. All of the information was taken directly from an exhibit prepared by the Executive Director.

MINNESOTA STATE RETIREMENT SYSTEM
GENERAL PLAN
COVERED EMPLOYEE STATEMENT
FISCAL YEAR 1976
As Required by Minnesota Statutes, Chapter 356

	<u>Number</u>	<u>Annualized Payroll</u>
Active at July 1, 1975	38,966	\$383,302,933.30
New Entrants*	<u>8,314</u>	71,004,582.84
Total	47,280	
Less Separations from Active Service:		
Refund of Contributions*	4,764	30,511,340.72
Separation with a vested Right to a Deferred Annuity	52	536,963.95
Separation with Neither Refundment Nor Right to a Deferred Annuity	1,268	6,708,067.22
Disability	78	820,793.50
Death*	89	913,650.84
Service Retirement	839	9,420,027.23
Death While Eligible Annuity	<u>4</u>	57,273.04
Total Separations	7,094	
Active at June 30, 1975	40,186	441,481,072.78

AVERAGE ENTRY AGE OF NEW EMPLOYEES

<u>For the Fiscal Year Ending</u>	<u>Male</u>	<u>Female</u>	<u>Average of Total</u>
6-30-72	30 yrs. 9 mos.	27 yrs. 9 mos.	28 yrs. 11 mos.
6-30-73	30 yrs. 4 mos.	27 yrs. 7 mos.	28 yrs. 6 mos.
6-30-74	29 yrs. 10 mos.	27 yrs. 10 mos.	28 yrs. 6 mos.
6-30-75	30 yrs. 2 mos.	28 yrs. 1 mo.	28 yrs. 10 mos.
6-30-76	28 yrs. 1 mo.	26 yrs. 0 mo.	26 yrs. 9 mos.

Average age at entry in State service for all active employees at 6-30-76

Average Male 30 yrs. 1 mo.

Average Female 28 yrs. 5 mos.

Total Average 29 yrs. 2 mos.

* Includes new and separated same year.

CORRECTIONAL RETIREMENT PLAN
COVERED EMPLOYEE STATEMENT
FISCAL YEAR 1976
As Required by Minnesota Statutes, Chapter 356

	<u>Number</u>	<u>Annualized Payroll</u>
Active at July 1, 1975	901	\$ 9,922,070.96
New Entrants*	230	2,483,454.72
Total	1,131	
Less Separations from Active Service:		
Refundment of Contributions	132	953,617.60
Separation with Deferred Annuity	1	12,588.00
Separation with Neither Refund- ment or Deferred Annuity	13	101,752.11
Death	1	13,070.88
Disability Retirement	1	11,630.16
Service Retirement	<u>57</u>	669,541.58
Total Separations	205	
Active at June 30, 1976	926	11,733,926.72

Average Entry Age of New Employees

<u>For the Fiscal Year Ending</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
6-30-74	29 yrs. 4 mos.	25 yrs. 2 mos.	28 yrs. 8 mos.
6-30-75	29 yrs. 5 mos.	29 yrs. 7 mos.	29 yrs. 5 mos.
6-30-76	27 yrs. 0 mos.	25 yrs. 6 mos.	26 yrs. 9 mos.

Average Entry Age for All Active Employees at 6-30-76

Average Male	29 yrs. 1 mo.
Average Female	29 yrs. 2 mos.
Total Average	29 yrs. 1 mo.

* Includes new and separated same year

MINNESOTA STATE RETIREMENT SYSTEM
GENERAL PLAN
ANNUITANT STATEMENT AT JUNE 30, 1976
As Required by Minnesota Statutes, Chapter 356

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
1. SERVICE RETIREMENT ANNUITANTS		
Receiving at June 30, 1975	5,109	\$10,203,320.64
New	847	1,942,459.20
	5,956	12,145,779.84
Death	245	419,989.80
	5,711	11,725,790.04
Adjustments-Net Result	1	2,736.00
Receiving at June 30, 1976	5,712	11,723,054.04
2. DISABLED EMPLOYEES		
Receiving at June 30, 1975	289	405,707.28
New	79	150,904.44
	368	556,611.92
Deaths	17	25,384.68
	351	531,227.04
Disability Rescinded	1	797.88
	350	530,429.16
Adjustments-Net Result	2	3,869.28
Receiving at June 30, 1976	348	526,559.88
3. WIDOWS RECEIVING AN ANNUITY OR SURVIVOR BENEFIT		
(a) Beneficiaries Receiving an Optional or Reversionary Annuity		
Receiving at June 30, 1975	209	256,486.44
New	24	39,610.80
	233	296,097.24
Deaths	7	9,012.24
Receiving at June 30, 1976	226	287,085.00
(b) Spouses Receiving a Survivor Benefit		
Receiving at June 30, 1975	30	33,892.32
Deaths	5	5,984.52
Remarriage	1	975.00
Receiving at June 30, 1976	24	26,932.80

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
4. CHILDREN RECEIVING A SURVIVOR BENEFIT		
Receiving at June 30, 1976		
5. DEFERRED ANNUITANTS		
Receiving at June 30, 1975	729	\$ 598,519.92
New	50	41,372.28
	779	639,892.20
Deaths	27	20,762.40
	752	619,129.80
Adjustments	0	2.88
Receiving at June 30, 1976	752	619,132.68

AVERAGE AGE AT RETIREMENT OF NEW SERVICE ANNUITANTS

<u>FISCAL YEAR ENDING</u>	<u>AVERAGE RETIREMENT AGE</u>
6-30-72	66 yrs. 3 mos.
6-30-73	65 yrs. 11 mos.
6-30-74	65 yrs. 4 mos.
6-30-75	65 yrs. 2 mos.
6-30-76	64 yrs. 11 mos.

AVERAGE AGE AT RETIREMENT OF ALL EXISTING SERVICE ANNUITANTS

65 yrs. 8 mos.

CORRECTIONAL RETIREMENT PLAN
 ANNUITANT STATEMENT AT JUNE 30, 1976
As Required by Minnesota Statutes, Chapter 356

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
1. SERVICE RETIREMENT ANNUITANTS		
Receiving at June 30, 1975	107	\$ 538,572.72
New	58	252,426.48
	165	\$ 790,999.20
Death	3	20,768.88
	162	770,230.32
Adjustments-Net Result	0	30,588.24
Receiving at June 30, 1976	162	739,642.08
2. DISABLED EMPLOYEES		
Receiving at June 30, 1975	None	
New	2	4,849.56
Deaths	None	
Receiving at June 30, 1976	2	4,849.56
3. WIDOWS RECEIVING AN ANNUITY OR SURVIVOR BENEFIT	None	
4. CHILDREN RECEIVING A SURVIVOR BENEFIT	None	
5. DEFERRED ANNUITANTS	None	

AVERAGE AGE AT RETIREMENT

NEW SERVICE ANNUITANTS
FISCAL YEAR ENDING

6-30-74
 6-30-75
 6-30-76

AVERAGE RETIREMENT AGE

62 yrs. 3 mos.
 60 yrs. 4 mos.
 58 yrs. 9 mos.

ALL EXISTING SERVICE ANNUITANTS

59 yrs. 11 mos

)

Section 356.215, Subdivision 4 of the Minnesota Statutes requires an
an analysis of the increase or decrease in the Unfunded Supplemental
Present Value that occurred since the last valuation. This exhibit is
shown on the following page.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES, CHAPTER 356,
SECTION 356.215, SUBDIVISION 4
FISCAL YEAR ENDING JUNE 30, 1976

1.	Unfunded Supplemental Present Value June 30, 1975		\$182,958,682
2.	Change due to current rate of funding and interest requirement:		
	(a) 1975-76 Past Service Contribution	\$12,142,138	
	(b) 5% interest requirement	<u>9,147,934</u>	- 2,994,204
3.	Change due to actuarial gains (-) or losses (+) because of 1975-76 experience deviations from expected:		
	(a) Mortality of Retired Persons (Statutory)	+12,058,953	
	(b) Excess interest earnings	- 63,251	
	(c) Recognized Unrealized Appreciation	+ 902,189	
	(d) Withdrawals	- 602,831	
	(e) Age and Service retirements	+ 781,618	
	(f) Disability retirements	- 291,638	
	(g) Deaths in active service	+ 8,881	
	(h) Salary increases (Balancing item)	<u>+ 2,348,727</u>	+ 15,142,648
4.	Change due to 1975-76 entrants		- 3,049,085
5.	Change due to new calculation method for spouse benefits		- 3,658,722
6.	Change due to new EANC rates		- 10,976,165
7.	Unfunded Supplemental Present Value June 30, 1976		\$177,423,154

SCHEDULE 1

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	6		
21	2,250	6		
22	2,080	7		
23	1,920	7		
24	1,760	7		
25	1,600	7		
26	1,470	7		
27	1,340	7		
28	1,230	8		
29	1,130	8		
30	1,040	8	2	
31	950	9	2	
32	890	10	2	
33	830	11	2	
34	770	12	2	
35	720	13	2	
36	680	15	2	
37	640	16	2	
38	600	18	2	
39	560	20	2	
40	530	22	2	
41	500	25	2	
42	480	27	2	
43	460	29	2	
44	430	32	2	
45	410	35	2	
46	390	38	3	
47	370	41	4	
48	350	44	5	
49	340	48	6	

SCHEDULE 1

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>
50	320	52	7	
51	300	57	8	
52	280	63	10	
53	260	70	12	
54	240	77	14	
55	210	85	17	
56	170	93	20	
57	140	102	23	
58	90	111	28	30
59	40	120	33	30
60		130	38	40
61		140	45	150
62		150	55	150
63		160	68	250
64		170	87	1,350
65				10,000

SCHEDULE 2

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	1		
21	3,550	2		
22	3,390	2		
23	3,230	2		
24	3,070	3		
25	2,910	3		
26	2,750	4		
27	2,600	4		
28	2,430	4		
29	2,270	4		
30	2,120	4		
31	1,970	4		
32	1,820	4		
33	1,680	4		
34	1,540	4		
35	1,410	4	1	
36	1,300	5	1	
37	1,190	5	1	
38	1,090	6	1	
39	1,000	7	2	
40	920	8	2	
41	850	8	2	
42	780	9	3	
43	720	11	3	
44	680	13	3	
45	630	15	3	
46	590	17	4	
47	560	19	4	
48	530	21	4	
49	500	23	5	

SCHEDULE 2

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>
50	470	25	5	
51	440	27	6	
52	410	30	7	
53	390	33	8	
54	360	36	10	
55	330	39	12	
56	290	43	15	
57	230	47	18	
58	170	51	22	50
59	90	56	26	50
60		61	31	150
61		66	37	150
62		72	44	200
63		78	52	350
64		83	61	1,100
65				10,000

SCHEDULE 3

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	6		
21	2,250	6		
22	2,080	7		
23	1,920	7		
24	1,760	7		
25	1,600	7		
26	1,470	7		
27	1,340	7		
28	1,230	8		
29	1,130	8		
30	1,040	8	2	
31	950	9	2	
32	890	10	2	
33	830	11	2	
34	770	12	2	
35	720	13	2	
36	680	15	2	
37	640	16	2	
38	600	18	2	
39	560	20	2	
40	530	22	2	
41	500	25	2	
42	480	27	2	
43	460	29	2	
44	430	32	2	
45	410	35	2	
46	390	38	3	
47	370	41	4	
48	350	44	5	
49	340	48	6	

SCHEDULE 3

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>
50	320	52	7	
51	300	57	8	
52	280	63	10	
53	260	70	12	
54	240	77	14	
55				10,000

SCHEDULE 4

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	1		
21	3,550	2		
22	3,390	2		
23	3,230	2		
24	3,070	3		
25	2,910	3		
26	2,750	4		
27	2,600	4		
28	2,430	4		
29	2,270	4		
30	2,120	4		
31	1,970	4		
32	1,820	4		
33	1,680	4		
34	1,540	4		
35	1,410	4	1	
36	1,300	5	1	
37	1,190	5	1	
38	1,090	6	1	
39	1,000	7	2	
40	920	8	2	
41	850	8	2	
42	780	9	3	
43	720	11	3	
44	680	13	3	
45	630	15	3	
46	590	17	4	
47	560	19	4	
48	530	21	4	
49	500	23	5	

SCHEDULE 4

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>
50	470	25	5	
51	440	27	6	
52	410	30	7	
53	390	33	8	
54	360	36	10	
55				10,000

AGE/SERVICE DISTRIBUTION TOTAL OF ALL COST GROUPS

AGE	** SERVICE **														TOTAL
*****	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35-	*****	*****	
15-19	*NO. *	0	0	0	0	0	0	0	0	0	0	0	0	0	
	TOT.AMT	0	0	0	0	0	0	0	0	0	0	0	0	0	
	AVE.AMT*	0	0	0	0	0	0	0	0	0	0	0	0	0	
20-24	*NO. *	2612	2127	1285	531	254	197	0	0	0	0	0	0	7006	
	TOT.AMT	20079102	17618542	11247288	4743789	2210124	1768082	0	0	0	0	0	0	57666927	
	AVE.AMT*	7687	8283	8753	8934	8701	8975	0	0	0	0	0	0	8231	
25-29	*NO. *	1842	1793	1411	824	646	1631	92	0	0	0	0	0	8239	
	TOT.AMT	16475912	17344995	14750629	9094458	7261693	18155372	1006346	0	0	0	0	0	84089405	
	AVE.AMT*	8945	9674	10454	11037	11241	11131	10939	0	0	0	0	0	10206	
30-34	*NO. *	769	716	562	337	394	1525	636	22	0	0	0	0	4961	
	TOT.AMT	7612967	7458527	6523059	3914848	4976717	20435769	8389921	272121	0	0	0	0	59583929	
	AVE.AMT*	9900	10417	11607	11617	12631	13400	13192	12369	0	0	0	0	12010	
35-39	*NO. *	408	397	296	183	183	879	666	321	43	0	0	0	3376	
	TOT.AMT	3873577	4095960	3500128	2103721	2237486	11639300	9817315	4657200	616928	0	0	0	42541615	
	AVE.AMT*	9494	10317	11825	11496	12227	13242	14741	14508	14347	0	0	0	12601	
40-44	*NO. *	305	283	248	149	171	748	462	401	263	17	0	0	3047	
	TOT.AMT	3008140	2801946	2780928	1613076	2031288	9556605	6431234	6353831	4092643	249290	0	0	38918981	
	AVE.AMT*	9863	9901	11213	10826	11879	12776	13920	15845	15561	14664	0	0	12773	
45-49	*NO. *	247	275	244	150	148	824	433	370	295	147	8	0	3141	
	TOT.AMT	2245295	2787702	2522858	1647070	1738595	9843535	5709004	5663983	4691236	2414174	91770	0	39355222	
	AVE.AMT*	9090	10137	10340	10980	11747	11946	13185	15308	15902	16423	11471	0	12530	
50-54	*NO. *	204	226	204	161	163	954	610	367	361	293	49	1	3593	
	TOT.AMT	1685030	2255880	2169505	1668343	1923045	11269538	7634444	5022438	5342675	5055753	779558	16778	44822987	
	AVE.AMT*	8260	9982	10635	10362	11798	11813	12515	13685	14800	17255	15909	16778	12475	
55-59	*NO. *	138	154	166	130	139	925	661	448	382	343	136	49	3671	
	TOT.AMT	1138591	1488645	1610015	1352146	1582526	10316432	7894042	5686107	5274192	5571611	2233688	840437	44988432	
	AVE.AMT*	8251	9667	9699	10401	11385	11153	11943	12692	13807	16244	16424	17152	12255	
60-64	*NO. *	43	74	82	70	79	727	607	393	292	214	110	99	2790	
	TOT.AMT	340579	612794	792763	672349	848309	7910002	6833780	4730615	3681457	3018359	1624207	1724195	52789409	
	AVE.AMT*	7920	8281	9668	9605	10738	10880	11258	12037	12608	14104	14766	17416	11752	
65-	*NO. *	15	10	7	5	10	93	79	66	36	20	8	13	362	
	TOT.AMT	95448	105002	43962	32198	115998	1015290	915064	796985	475325	310955	134459	258065	4298751	
	AVE.AMT*	6363	10500	6280	6440	11600	10917	11583	12076	13203	15548	16807	19851	11875	
TOTAL	*NO. *	6583	6055	4505	2540	2187	8503	4246	2388	1672	1034	311	162	40186	
	TOT.AMT	56554641	56569993	45941135	26841998	24925781	101909925	54631150	33183280	24174456	16620142	4863682	28394754	449055658	
	AVE.AMT*	8591	9343	10198	10568	11397	11985	12866	13896	14458	16074	15639	17528	11174	

AVERAGE AGE * 38.0 * AVERAGE SERVICE * 6.5 *

MSRS VALUATION AS OF JUNE 30, 1976

The purpose of this memorandum is to discuss the valuation report of the Minnesota State Retirement System dated November 9, 1976 which was submitted to the Commission in accordance with Chapter 356 of Minnesota Laws 1974. The valuation was made using the entry age normal cost method and assuming 5% interest. The report was prepared by Harry M. Church of Towers, Perrin, Forster and Crosby, Consulting Actuaries.

This memo contains the following:

1. Statistical and Valuation Data
2. Discussion of Valuation Results
3. Conclusion

1. Statistical and Valuation Data

Results of the valuation reports as of June 30, 1975 and June 30, 1976 are shown for comparative purposes. Figures are rounded where necessary for simplicity of presentation.

	<u>As of</u> <u>June 30, 1975</u>	<u>As of</u> <u>June 30, 1976</u>
(1) <u>Membership</u>		
Active Members	39,867*	41,112*
Inactive Members	3,889	3,802
Retired Members	5,945	6,626
Disabled Members	289	350
Survivors of Deceased Members	239	250

*Including correctional employees numbering 901 and 926, respectively.

(2) Payroll and Annuities Payable

Total Annualized Payroll	\$414.9 Million	\$461.0 Million
Annuities (annual)	12.0 Million	13.9 Million

441,481,073 G
11,733,021 C

	As of June 30, 1975	As of June 30, 1976
(3) <u>Valuation Balance Sheet</u>		
Accrued Liability	\$448.5 Million	\$470.4 Million
Assets	<u>265.5 Million</u>	<u>293.0 Million</u>
Unfunded Accrued Liability (Deficit)	\$183.0 Million*	\$177.4 Million*
Funding Ratio (Ratio of Assets to Accrued Liability)	59.2%	62.3%

*\$168.7 Million for regular employees and \$8.7 Million for correctional employees compared with 1975 figures of \$173.9 Million and \$9.1 Million, respectively.

	Percent of Covered Payroll			
	As of June 30, 1975		As of June 30, 1976	
	Regular	Correctional	Regular	Correctional
(4) <u>Normal Cost and Funding Costs</u>				
Normal Cost	6.91%	10.79%	7.30%	10.78%
Expenses	<u>0.14%</u>	<u>0.14%</u>	<u>.14</u>	<u>0.14</u>
Normal Cost plus Expenses	7.05%	10.93%	7.44%	10.92%
Normal Cost plus Expenses	7.05%	10.93%	7.44%	10.92%
Interest on Deficit	<u>2.15</u>	<u>4.34</u>	<u>1.88</u>	<u>3.62</u>
Total ("Minimum Contribution")	9.20%	15.27%	9.32%	14.54%
Normal Cost plus Expenses	7.05%	10.93%	7.44%	10.92%
Amortization by 1997	<u>3.11</u>	<u>6.28</u>	<u>2.79</u>	<u>5.39</u>
Total ("Required Contribution")	10.16%	17.21%	10.23%	16.31%
(5) <u>Statutory Contributions</u>				
Employee	4.0%	6.0%	4.0%	6.0%
Employer Regular	4.0	9.0	4.0	9.0
Employer Additional	<u>2.0</u>	<u>5.0</u>	<u>2.0</u>	<u>5.0</u>
Total Contributions	10.0%	20.0%	10.0%	20.0%
(6) Investment Yield (A)	4.79%		4.92%	

(A) Ratio of investment income (on an accrual basis) to mean assets.*

*Excluding assets in Minnesota Adjustable Fixed Benefit Fund;
including change in recognized unrealized appreciation or depreciation.

2. Discussion of Valuation Results

Beginning in 1973, the MSRS valuation includes information about a small group of employees called Correctional Employees whose benefits, contributions and normal retirement ages differ from those of the main group. This requires the presentation of a separate funding analysis.

The change in the normal cost for the Regular Group came about as the result of a change in method. Prior to the 1976 valuation, the MSRS Actuaries used only the new employees during the most recent five-year period to determine the normal cost percentage and then applied this percentage to the entire group. This year, the normal cost for each participant was determined individually, and the percentage is the ratio of the sum of the individual normal costs to the payroll. The increase which resulted from the change in the method for calculating normal cost has the opposite effect on the accrued liability as will be pointed out later.

The above summary shows a slight deficiency in the actuarial balance for the Regular Group, but we believe that this is not of great importance. If the total deficit is regarded as belonging to the entire System, then the present total financing provides for amortizing the deficit in a period which extends a year or two beyond 1997.

We wish to direct attention to the fact that the report itself does not present the funding picture in exactly the above manner. One of the deviations from the above is in the conservative direction and the other is not.

The total deficit is separated into two portions: (a) the present value of the excess of the regular contributions over the normal cost plus expenses; (b) the total deficit minus (a). Since the period for determining the present value of contributions is the remaining active service based upon the assumed deaths and terminations, the average such period is substantially less than the 21 years to 1997. Thus, this approach provides for funding the (a) portion of the deficit in a relatively short period which is a conservative approach.

However, this leaves a large part of the deficit in the (b) portion which must be amortized with the employer's additional 2% and 5% contributions. With payrolls at the present levels, this would require 32 years for the Regular Group and 12 years for the Correctional Group; on a combined basis, the period would be 30 years. The report shows 19 years for the Regular Group and 10 years for the Correctional Group based upon an assumption that the total payroll will increase at the rate of 3 1/2% per year.

During the year, the unfunded accrued liability decreased from \$182,958,682 to \$177,423,154, a decrease of \$5,535,528. The MSRS Actuary gives the following analysis of the net decrease:

Decreases:

Amortization Contribution	\$ 2,994,204	
Excess Interest	63,251	
Deviations in Terminations	602,831	
Deviations in Disablements	291,638	
Change from New Entrants	3,049,085	
New Method for Normal Cost	10,976,165	
New Method for Spouses Benefit	<u>3,658,722</u>	
Total Decreases		\$21,635,896

Increases:

Mortality - Retired Lives	<u>\$12,058,953</u>	
Deviations in Retirements	781,618	
Change in Recognized Unrealized		
Depreciation	902,189	
Mortality - Active Lives	8,881	
Salary Scale Loss	<u>2,348,727</u>	
Total Increases		<u>16,100,368</u>

Net Decrease \$ 5,535,528

3. Conclusion

The 1975 Valuation Report filed by MSRS conforms with the requirements of Chapter 356 with the exception noted above relative to the financing of the deficit.

Franklin C. Smith
Associate, Society of Actuaries
Stennes & Associates, Inc.
Commission Actuaries

STENNES & ASSOCIATES, INC.
ACTUARIES AND CONSULTANTS

2850 METRO DRIVE
MINNEAPOLIS, MINNESOTA 55420
(612) 854-1155

November 24, 1976

Mr. Harry M. Church
Towers, Perrin, Forster and Crosby
One Century Plaza
Los Angeles, CA 90067

Re: 19⁷⁶ MSRS Valuation

Dear Harry:

In preparing a memorandum for the Commission which summarizes the 1976 MSRS Valuation, I have run into a couple of questions. I always try to anticipate the questions which members of the Commission will raise and have ready answers if it is possible to do so.

First, the normal cost for the General Plan increased from 6.91% of payroll to 7.30%. I could not find any obvious explanation in the basic data and ask whether you know the reason why this increase occurred.

The analysis of the change in the unfunded accrued liability last year showed an increase from disablement of \$154,821. This year, the corresponding item is a decrease of \$291,638 which means that we have a change of an amount close to \$450,000. Last year, the census figures showed 48 disablements among the General Members and none among the Correctional Employees compared with this year's figures of 78 and 1, respectively. I realize that this gain or loss item depends more upon the length of service at the time of disablement than upon the number of individuals who become disabled during the year, but since we have a change from a loss to a gain in a year in which the number of disablements is substantially greater, I thought that I should raise a question about this item.

I was certainly interested in your estimate of the mortality loss among retired participants compared with the result of applying the statute. We hope that we can get this situation corrected in the near future.

Sincerely yours,

Franklin C. Smith

FCS:mf

cc: Mr. John Mandeville
Mr. Paul L. Groschen