REPORT ON

ACTUARIAL VALUATION

MINNESOTA STATE RETIREMENT SYSTEM

JUNE 30, 1974

October 31, 1974

COATES AND CRAWFORD, CONSULTING ACTUARIES

COATES AND CRAWFORD
CONSULTING ACTUARIES
301 EAST COLORADO BOULEVARD
PASADENA, CALIFORNIA 91101
(213) 681-4455

EDWARD L. CHAPIN
HARRY M. CHURCH
BARRETT N. COATES, JR.
ANGUS L. CRAWFORD
ROBERT H. LITTLE

PASADENA
SAN FRANCISCO

October 31, 1974

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, 1974.

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 accrued liability of the System.

We hereby certify that the actuarial valuation of the Minnesota State Retirement System made as of June 30, 1974 was carried out on the basis of accepted actuarial methods and procedures and in accordance with the provisions of Minnesota Statutes 1971, Chapter 356. The results of that valuation indicate that the contributions required from the employees and from the State under Minnesota Statutes 1971, Chapter 352, as amended by Laws 1973 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,

COATES AND CRAWFORD
Consulting Actuaries

By ______________________
Robert H. Little, F.S.A.

RHL:th

REPORT ON ACTUARIAL VALUATION OF THE MINNESOTA STATE RETIREMENT SYSTEM AS OF JUNE 30, 1974

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, 1974 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, 1974. 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, 1974. No physical audit of these assets was made by us and our calculations are based upon the Financial Report as submitted.

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, 1971.

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 actuarial assumptions developed during the course of the actuarial investigation carried out as of June 30, 1971. We modified the assumptions to reflect compulsory retirement age 65 for General Employees and we assumed Correctional Employees will retire upon attaining age 55. 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. Also, we reflected the 7% average salary increase that became effective July 1, 1974.

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 accrued liability 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 General Employees, we carried out a complete valuation of active members as of June 30, 1974 who were employed during the preceding five-year period. The results of these calculations indicate that the total entry age normal cost rate under the new scale of benefits for General Employees amounts to 7.00% of salary. General Employees are required by law to contribute 4% and, accordingly, the State's share of the entry age normal cost contribution rate for General Employees amounts to 3.00%.

Using the same procedure, we calculated the total entry age normal cost rate for Correctional Employees to be 10.72% of salary. Correctional Employees are required by law to contribute 6% and, accordingly, the State's share of the entry age normal cost contribution for Correctional Employees amounts to 4.72%.

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.

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	$88,733,034.97
Correctional Employees	2,885,999.59
Total	$91,619,034.56

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, 1974

ASSETS

Cash in office	$ 25.00
Cash in State Treasury	583,407.13
Short term investments (at cost)	8,938,731.54
Accounts receivable:	
a) Accrued employee contributions	516,177.85
b) Accrued employer contributions	795,508.60
c) Employee back payments	154,514.23
d) Investment maturities and sales	121,624.74
e) Due from other plans	32,355.70
f) Other	13,550.34
Accrued interest in investments	1,208,300.53
Dividends declared & payable, but not yet received	20,090.47
Investments in debt securities at amortized cost	66,347,745.66
Investments in equities at cost (1)	66,148,913.36
Recognized unrealized appreciation in equities	2,766,766.36
Equipment at depreciated cost	11,639.24
Deferred yield adjustment account	2,289,402.01
Participation in the MAFB Fund	85,363,980.73
Total Assets	$235,312,733.49

LIABILITIES AND RESERVES

LIABILITIES	
Accounts payable:	
a) Security purchases	$ 384,957.42
b) Annuities	1,843.35
c) Survivor benefits	65.00
d) Annuitant deposits	10,981.83
e) Accrued expenses	48,366.39
f) Overpaid dividends	1,385.00
g) Transfer to unclassified employee retirement	46,848.13
Suspense item: Unredeemed 6 year old warrants	4,860.56
Total Liabilities	$ 499,307.68
RESERVES	
Employee contribution reserve	$ 57,523,936.52
Survivor benefit reserve	306,474.00
Reserve for participation in the MAFB Fund	85,363,980.73
State contribution reserve	91,619,034.56
Total Reserves	$234,813,425.81
Total Liabilities and Reserves	$235,312,733.49

(1) Market value at June 30, 1974 was $56,088,800.

MINNESOTA STATE RETIREMENT SYSTEM

ACTUARIAL BALANCE SHEET
AS OF
JUNE 30, 1974

ASSETS

1.	Assets on Hand from Accounting Balance Sheet:		
	a) Participation in MAFB Fund	$ 85,363,980.73	
	b) All other assets	149,948,752.76	$235,312,733.49
2.	Present Value of Employees' Future Contributions		114,756,306.00
3.	Present Value of State Future Contributions Applicable to:		
	a) Entry Age Normal Cost	$ 86,157,161.00	
	b) Unfunded Accrued Liability (Balance of "Matching" Contribution less .14% for Operating Expenses)	25,837,619.00	
	c) Unfunded Accrued Liability (Portion to be funded by "Additional" Contribution)	137,255,617.19	249,250,397.19
4.	TOTAL ASSETS		$599,319,436.68

LIABILITIES

5.	Current Liabilities from Accounting Balance Sheet		$ 499,307.68
6.	Present Value of Earned and Earnable Benefits Payable to Presently Active Members:		
	a) Retirement Benefits	$416,688,934.00	
	b) Disability Benefits	21,819,454.00	
	c) Refundments due to death or withdrawal	61,177,883.00	
	d) Surviving Spouse Benefits	11,203,992.00	510,890,263.00
7.	Present Value of Benefits for Deferred Annuitants:		
	a) Retirement Benefits	$ 2,189,954.00	
	b) Refundments due to death or withdrawal	120,823.00	
	c) Benefits already authorized	1,440.00	2,312,217.00
8.	Present Value of Refundments to former members without vested rights		283,868.00
9.	Present Value of Survivor Benefits		306,474.00
10.	Present Value of Benefits Payable from MAFB Fund		85,071,871.00
11.	MAFBF Annuity Stabilization Account		(44,564.00)
12.	TOTAL LIABILITIES		$599,319,436.68

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 3.00% of General Employees' salaries and 4.72% 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 .86% of General Employees' salaries and 4.14% 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:

	Correctional Employees	General Employees	Total
1. Annualized Salaries July 1, 1974	$ 7,961,685	$352,611,463	$360,573,148
2. State "Additional" contribution rate	5%	2%	
3. Annual State "Additional" contribution	398,084	7,052,229	7,450,313
4. Item 3(c) Actuarial Balance Sheet	9,194,813	128,060,804	137,255,617
5. Years (to nearest year) required to amortize Item 3(c) of Actuarial Balance Sheet by "Additional" State Contributions which increase in accordance with salary scale	28	21	22
6. First year annual contribution with subsequent salary scale increases required to amortize Item 3(c) of Actuarial Balance Sheet over Period Ending June 30, 1997	472,123	6,575,497	7,047,620
7. Total Unfunded Accrued Liability (Item 3(b) plus Item 3(c) of Actuarial Balance Sheet)	$10,887,147	$152,206,089	$163,093,236

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, 1974 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 $85,071,871 shown for Item 9 represents the value of benefits payable from the MAFB to MSRS retirees. The Accounting Balance Sheet shows the MAFB Fund as $85,363,981. The difference is due to the 1973-74 experience as follows:

		MAFB Fund
1.	Accounting Balance Sheet	$85,363,981
2.	Mortality Gain 1973-74	- 336,674
3.	Interest Loss 1973-74	+ 44,564
4.	Actuarially Computed Reserve	$85,071,871

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 twenty-two years.

SECTION III

REQUIRED EXHIBITS

Minnesota Statutes 1971, 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 1971, Chapter 356, is presented on the following pages of this Section III 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 1971, CHAPTER 356, SECTION 356.20, SUBDIVISION 4(1)
AS OF JUNE 30, 1974

ASSETS AND UNFUNDED ACCRUED LIABILITY

Assets		
1.	Cash in office	$ 25.00
2.	Cash in State Treasury	583,407.13
3.	Short term investments (at cost)	8,938,731.54
4.	Accounts receivable:	
	a) Accrued employee contributions	516,177.85
	b) Accrued employer contributions	795,508.60
	c) Employee back payments	154,514.23
	d) Investment maturities and sales	121,624.74
	e) Due from other plans	32,355.70
	f) Other	13,550.34
5.	Accrued interest in investments	1,208,300.53
6.	Dividends declared & payable, but not yet received	20,090.47
7.	Investments in debt securities at amortized cost	66,347,745.66
8.	Investments in equities at cost	66,148,913.36
9.	Recognized unrealized appreciation in equities	2,766,766.36
10.	Equipment at depreciated cost	11,639.24
11.	Deferred yield adjustment account	2,289,402.01
12.	Participation in the MAFB Fund	85,363,980.73
13.	Total Assets	$235,312,733.49
Unfunded Accrued Liability		
14.	Unfunded Accrued Liability 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	$ 25,837,619.00
15.	Unfunded Accrued Liability to be funded by State's "Additional" contribution	137,255,617.19
16.	Total Unfunded Accrued Liability	$163,093,236.19
17.	TOTAL ASSETS AND UNFUNDED ACCRUED LIABILITY	$398,405,969.68

CURRENT LIABILITIES AND RESERVES REQUIRED

Current Liabilities		
18.	Accounts payable:	
	a) Security purchases	$ 384,957.42
	b) Annuities	1,843.35
	c) Survivor benefits	65.00
	d) Annuitant deposits	10,981.83
	e) Accrued expenses	48,366.39
	f) Overpaid dividends	1,385.00
	g) Transfer to unclassified employee retirement	46,848.13
19.	Suspense item: Unredeemed 6 year old warrants	4,860.56
20.	MAFBF Annuity Stabilization Account	(44,564.00)
21.	Total Liabilities	$ 454,743.68
Reserves Required		
22.	Total Reserves Required per attached schedule	$397,951,226.00
23.	TOTAL CURRENT LIABILITIES AND RESERVES REQUIRED	$398,405,969.68

Note: Accumulated contributions, without interest, of members not yet retired amounted to $57,523,936.52 as of June 30, 1974.

MINNESOTA STATE RETIREMENT SYSTEM

DETERMINATION OF RESERVES REQUIRED AS OF JUNE 30, 1974

Benefits For:	(1) Present Value of Benefits	(2) Present Value of Applicable Portion of Normal Cost Contribution	(3) Reserves Required (1) - (2)
1. Active Members:			
a) Retirement Benefits	$416,688,934	$122,046,374	$294,642,560
b) Disability Benefits	21,819,454	11,857,287	9,962,167
c) Refundments due to death or withdrawal	61,177,883	61,394,624	(216,741)
d) Surviving Spouse Benefits	11,203,992	5,615,182	5,588,810
2. Deferred Annuitants	2,312,217	-	2,312,217
3. Former Members Without Vested Rights	283,868	-	283,868
4. Survivors	306,474	-	306,474
5. Benefits Payable from MAFB Fund	85,071,871	-	85,071,871
6. Total	$598,864,693	$200,913,467	$397,951,226

Minnesota Statutes 1971, 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 III. 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 Accrued Liability of the System over the period covered by the analysis, we have confirmed that fact in Item 15 of the exhibit.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1971, CHAPTER 356, SECTION 356.20, SUBDIVISION 4(2) and (3) FISCAL YEAR ENDING JUNE 30, 1974

ANALYSIS OF INCOME AND DEDUCTIONS FROM INCOME

INCOME			
1.	From Employees		
	Employee contributions		$12,004,061.13
	Employee accrued contributions receivable		516,127.85
	Employee contributions, accounts receivable		41,702.85
2.	From Employers		
	Employer contributions		12,302,766.02
	Employer additional contributions		6,142,628.60
	Employer accrued contributions receivable		795,508.60
3.	From Investments		
	Interest on debt securities & short term investments		4,643,958.27
	Dividends on corporate stock		2,122,259.99
	Recognized unrealized appreciation in stock		1,110,262.59
	Premium on bonds called		3,354.66
	Participation in MAFB Fund income		3,656,632.56
	Gain on sale of stock		191,074.50
4.	Other Revenues		
	Interest on back payments by employers		76,856.74
	Miscellaneous		1,011.94
5.	TOTAL INCOME		$43,608,206.30
DEDUCTION FROM INCOME			
6.	Increase in MAFBF Annuity Stabilization Account		$ (44,564.00)
7.	Benefits		
	Service retirement benefits		8,618,029.22
	Disability retirement benefits		312,079.64
	Survivor benefits (spouses)		31,145.08
	Interest paid - deceased employees		69,461.95
	Interest paid - compulsory retirees		5,192.37
8.	Refundments (Employee Contributions)		
	Left service & coverage by other systems		2,502,190.95
	Employee deaths		217,810.54
	Annuitant deaths		60,832.37
	Erroneous deductions		12,270.93
	Interest paid - over three years' service		44,212.19
9.	Unclassified Employee Retirement		
	Transfer of employee contributions		283,009.98
	Transfer of employer contributions		376,518.96
	Transfer of interest		13,165.36
10.	Operating Expenses		461,848.06
11.	Prior Year Adjustments		18,006.23
12.	Increase in Total Reserves Required		
	Reserves Required 6-30-73	$363,284,460.00	
	Reserves Required 6-30-74	397,951,226.00	34,666,766.00
13.	TOTAL DEDUCTIONS FROM INCOME		$47,647,975.83
14.	EXCESS OF INCOME OVER DEDUCTIONS FROM INCOME		(4,039,769.53)
15.	REDUCTION IN UNFUNDED ACCRUED LIABILITY:		
	Unfunded Accrued Liability 6-30-73	$159,053,466.66	
	Unfunded Accrued Liability 6-30-74	163,093,236.19	$(4,039,769.53)

Minnesota Statutes 1971, 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 356.21, 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(4), Section 356.21, Subdivision 4(6), and Section 356.21, Subdivision 5(9) and (10) is presented on the following pages of this Section III. All of the information was taken directly from an exhibit prepared by the Executive Director.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1971, CHAPTER 356,
SECTION 356.20, SUBDIVISION 4(4), SECTION 356.21, SUBDIVISION 4(6) AND
SECTION 356.21, SUBDIVISION 5(9) AND (10)
FISCAL YEAR ENDING JUNE 30, 1974

COVERED EMPLOYEE STATEMENT

ACTIVE EMPLOYEES - GENERAL MEMBERS

	Number	Annualized Payroll
Active at July 1, 1973	36,792	$303,301,676.75
New Entrants, 7/1/73 - 6/30/74*	8,960	55,825,862.71
Total	45,752	
Less Separations from Active Service:		
Refundments *	5,428	30,388,628.19
Separation with a Vested Right to a deferred Annuity	56	425,819.06
Separation with neither refundment nor right to a deferred Annuity	1,365	5,556,018.17
Disability	61	506,744.80
Death *	110	866,077.93
Service Retirement	774	7,779,529.53
Death While Eligible Annuity	13	165,568.00
Total Separations	7,807	
Active at June 30, 1974:		
Regular Retirement Plan	37,945	$329,537,257.05
Correctional Retirement Plan	737	7,440,827.20
Total	38,682	$336,978,084.25

Average Entry Age of New Employees

For the Year	Male	Female	Average of Total
1/1/69 - 12/31/69	31 yrs. 1 mo.	26 yrs. 10 mos.	28 yrs. 2 mos.
1/1/70 - 6/30/71	32 yrs. 8 mos.	28 yrs. 1 mo.	29 yrs. 8 mos.
7/1/71 - 6/30/72	30 yrs. 9 mos.	27 yrs. 9 mos.	28 yrs. 11 mos.
7/1/72 - 6/30/73	30 yrs. 4 mos.	27 yrs. 7 mos.	28 yrs. 6 mos.
7/1/73 - 6/30/74	29 yrs. 10 mos.	27 yrs. 10 mos.	28 yrs. 6 mos.

Average age at entry into State service for all active employees at June 30, 1974:

Average Male	30 yrs. 10 mos.
Average Female	29 yrs. 1 mo.
Total Average	29 yrs. 11 mos.

*Includes new and separated same year.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1971, CHAPTER 356, SECTION 356.20, SUBDIVISION 4(4), SECTION 356.21, SUBDIVISION 4(6) AND SECTION 356.21, SUBDIVISION 5(9) AND (10)
FISCAL YEAR ENDING JUNE 30, 1974

COVERED EMPLOYEE STATEMENT

(Continued)

ACTIVE EMPLOYEES - CORRECTIONAL EMPLOYEES

	Number	Annualized Payroll
Active at July 1, 1973	677	$6,062,310.82
New Entrants, 7/1/73 - 6/30/74 *	189	2,050,766.86
Total	866	
Less Separations from Active Service:		
Refundments	107	716,551.76
Death	5	38,043.70
Service Retirement	17	141,876.80
Total Separations	129	
Active at June 30, 1974 *	737	$7,440,827.20

Average Entry Age of New Employees

For the Year	Male	Female	Total
7/1/73 - 6/30/74	29 yrs. 4 mos.	25 yrs. 2 mos.	28 yrs. 8 mos.

Average Entry Age for All Active Employees

Male	Female	Total
32 yrs. 3 mos.	34 yrs. 6 mos.	32 yrs. 6 mos.

*Includes employees in classes eligible to the Correctional Retirement Plan effective 7/1/74.

ANNUITANT STATEMENT

	Number	Annual Annuity Benefit Payable
(1) SERVICE RETIREMENT ANNUITANTS:		
Receiving at June 30, 1973	4,164	$5,445,551.76
New	744	2,351,665.32
	4,908	$7,797,217.08
Deaths	212	370,749.36
	4,696	$7,426,467.72
Benefit Increase	0	1,337,430.12
	4,696	$8,763,897.84
Adjustments - Net Result	3	3,858.12
Receiving at June 30, 1974 - MSRS	4,693 *	$8,760,039.72 *
Correctional Employees Receiving at June 30, 1974 (all new)	17	92,664.60
Total - MSRS and Correctional Plan	4,710 *	$8,852,704.32 *
(2) DISABLED EMPLOYEES:		
Receiving at June 30, 1973	237	$ 232,625.04
New	61	102,629.04
	298	$ 335,254.08
Deaths	24	29,254.80
	274	$ 305,999.28
Disability Recovered	1	1,565.52
	273	$ 304,433.76
Benefit Increase	0	56,710.44
Receiving at June 30, 1974	273 *	$ 361,144.20 *
(3) WIDOWS RECEIVING AN ANNUITY OR SURVIVOR BENEFIT:		
A. BENEFICIARIES RECEIVING AN OPTIONAL OR REVERSIONARY ANNUITY:		
Receiving at June 30, 1973	170	$ 145,875.72
New	31	43,908.12
	201	$ 189,783.84
Deaths	9	10,132.92
	192	$ 179,650.92
Benefit Increase	0	39,349.32
	192	$ 219,000.24
Adjustments - Net Result	3	3,858.12
Receiving at June 30, 1974	195 *	$ 222,858.36 *

ANNUITANT STATEMENT
(Continued)

	Number	Annual Annuity Benefit Payable
B. SPOUSES RECEIVING A SURVIVOR BENEFIT:		
Receiving at June 30, 1973	32	$ 28,967.64
Deaths	2	1,853.76
	30	$ 27,113.88
Benefit Increase	0	6,778.44
Receiving at June 30, 1974	30 *	$ 33,892.32 *
(4) CHILDREN RECEIVING A SURVIVOR BENEFIT:		
Receiving at June 30, 1973	0 *	00 *
No new additions		
(5) DEFERRED ANNUITANTS:		
Receiving at June 30, 1973	652	$ 439,971.12
New	94	68,520.24
	746	$ 508,491.36
Deaths	31	26,284.56
	715	$ 482,206.80
Benefit Increase	0	108,527.40
Receiving at June 30, 1974	715 *	$ 590,734.20 *

AVERAGE AGE AT RETIREMENT OF NEW SERVICE ANNUITANTS

YEAR	AVERAGE RETIREMENT AGE
1/1/69 - 12/31/69	66 years, 2 months
1/1/70 - 6/30/70	66 years, 0 months
7/1/70 - 6/30/71	65 years, 11 months
7/1/71 - 6/30/72	66 years, 3 months
7/1/72 - 6/30/73	65 years, 11 months
7/1/73 - 6/30/74	65 years, 4 months

AVERAGE AGE AT RETIREMENT OF ALL EXISTING SERVICE ANNUITANTS

66 years, 0 months

Section 356.21, Subdivision 4 of the Minnesota Statutes 1971 requires an analysis of the increase or decrease in the unfunded liability that occurred since the last valuation. The exhibit shown on the following pages of this Section III contains the information required by Section 356.21, Subdivision 4(1), (2), (3), (4) and (5).

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1971, CHAPTER 356, SECTION 356.21, SUBDIVISION 4(1), (2), (3), (4) and (5) FISCAL YEAR ENDING JUNE 30, 1974

1. Unfunded Accrued Liability June 30, 1973				$159,053,467
2. Change due to current rate of funding and interest requirement (Subdivision 4(4)):				
(a) 1973-74 Past Service Contribution	-	$ 9,095,293		
(b) 5% interest requirement	+	7,952,673	-	1,142,620
3. Change due to actuarial gains (-) or losses (+) because of 1973-74 experience deviations from expected (Subdivision 4(3)):				
(a) Mortality of Retired Persons	-	336,674		
(b) Excess interest earnings	+	362,334		
(c) Recognized Unrealized Appreciation	-	1,110,263		
(d) Withdrawals	+	26,229		
(e) Age and Service retirements	-	2,150,568		
(f) Disability retirements	-	128,284		
(g) Deaths in active service	+	158,038		
(h) Salary increases	+	11,157,153	+	7,977,965
4. Change due to 1973-74 entrants (Subdivision 4(5))			+	925,279
5. Change due to new EANC rates			-	3,720,855
6. Unfunded Accrued Liability June 30, 1974				$163,093,236

SCHEDULE 1

Male General Members

Probabilities of Separation from Active Service

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

Age	Withdrawal	Death	Disability	Age and Service Retirement
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
(Continued)

Probabilities of Separation from Active Service

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

Age	Withdrawal	Death	Disability	Age and Service Retirement
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)

Age	Withdrawal	Death	Disability	Age and Service Retirement
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
(Continued)

Probabilities of Separation from Active Service

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

Age	Withdrawal	Death	Disability	Age and Service Retirement
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)

Age	Withdrawal	Death	Disability	Age and Service Retirement
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
(Continued)

Probabilities of Separation from Active Service

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

Age	Withdrawal	Death	Disability	Age and Service Retirement
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)

Age	Withdrawal	Death	Disability	Age and Service Retirement
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
(Continued)

Probabilities of Separation from Active Service

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

Age	Withdrawal	Death	Disability	Age and Service Retirement
50	470	25	5	
51	440	27	6	
52	410	30	7	
53	390	33	8	
54	360	36	10	
55				10,000

DATE : June 14, 1974

FROM : Paul L. Groschen
Executive Director

SUBJECT:

MINNESOTA STATE RETIREMENT SYSTEM
529 Jackson Street
Saint Paul, Minnesota 55101

Tel. 296-2761

Office Memorandum

Frank Moulton
Executive Secretary
Legislative Retirement
Study Commission
21 State Office Building

Here are the answers to your memo regarding deferred benefits for Highway Patrolmen's Fund.

1. Number - 14

2. Total monthly benefit $2,774.82
   Total present value $307,180

3. Total gain - $85,852

4. (a) 12.34% increase would result in an increase of $37,906 to $345,086

   (b) 12% increase would result inaan increase of $36,862 to $344,042

In answer to your question regarding the delayed increase, Dr. Smith responds as follows:

"I am not sure about the purpose of the two dates which are given in Frank's memo relative to these increases. If the increase is going to be made, there is nothing to be gained by making it in two jumps except for the possible savings in benefit payments to a deferred annuitant who would start receiving benefit payments between the date of the first increase and the date of the second increase. In the Highway Patrol Fund, this certainly would not be a substantial item, and I doubt whether it is significant even in a large fund like MSRS or PERA."

Paul L Groschen

Paul L. Groschen, Exec. Dir.

PLG:cf

GVS Minnesota Memorandum No. 74-3
December 2, 1974

MSRS VALUATION AS OF JUNE 30, 1974

The purpose of this memorandum is to discuss the valuation report of the Minnesota State Retirement System dated October 31, 1974 which was submitted to the Commission in accordance with Chapter 249 of Minnesota Laws 1967. The valuation was made using the entry age normal cost method and assuming 5% interest. The report was prepared by Robert H. Little of Coates and Crawford, 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, 1973 and June 30, 1974 are shown for comparative purposes. Figures are rounded where necessary for simplicity of presentation.

	As of June 30, 1973	As of June 30, 1974
(1) Membership		
Active Members	37,469 *	38,682 *
Inactive Members	4,592	4,102
Retired Members	4,986	5,620
Disabled Members	237	273
Survivors of Deceased Members	32	30

*Including correctional employees numbering 677 and 737, respectively.

	As of June 30, 1973	As of June 30, 1974
(2) Payroll and Annuities Payable		
Total Annualized Payroll	$ 303.3 Million	$ 337.0 Million
Annuities (annual)	6.3 Million	10.1 Million
(3) Valuation Balance Sheet		
Accrued Liability	363.3 Million	398.0 Million
Assets	204.2 Million	234.9 Million
Unfunded Accrued Liability (Deficit)	159.1 Million *	163.1 Million *
Funding Ratio (Ratio of Assets to Accrued Liability)	56.2%	59.0%

* $152.2 Million for regular employees and $10.9 Million for correctional employees compared with 1973 figures of $151.7 Million and $7.3 Million, respectively.

	Percent of Covered Payroll			
	As of June 30, 1973		As of June 30, 1974	
	Regular	Correctional	Regular	Correctional
(4) Normal Cost and Funding Costs				
Normal Cost	6.85%	11.92%	7.00%	10.72%
Expenses	0.19	0.19	0.14	0.14
Normal Cost plus Expenses	7.04%	12.11%	7.14%	10.86%
Normal Cost plus Expenses	7.04%	12.11%	7.14%	10.86%
Interest on Deficit	2.41	5.69	2.16	6.84
Total ("Minimum Contribution")	9.45%	17.80%	9.30%	17.70%
Normal Cost plus Expenses	7.04%	12.11%	7.14%	10.86%
Amortization by 1997	3.32	7.85	3.05	9.66
Total ("Required Contribution")	10.36%	19.96%	10.19%	20.52%
(5) Statutory Contributions				
Employee	4.0%	6.0%	4.0%	6.0%
Employer Regular	4.0	9.0	4.0	9.0
Employer Additional	2.0	5.0	2.0	5.0
Total Contributions	10.0%	20.0%	10.0%	20.0%
(6) Investment Yield (A)	5.95% *		5.54% *	

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

* Excluding assets in Minnesota Adjustable Fixed Benefit Fund; including increase in recognized unrealized appreciation.

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 MSRS Actuary determines normal cost for the entire group from a calculation using only new employees during the most recent five-year period. This approach makes the normal cost sensitive to the employer's current hiring practices.

The change in the normal cost for the Regular Group of 0.15% is a nominal amount and within the limits of reasonable fluctuation. For the Correctional Group, the change was fairly large (11.92% to 10.86%). This group was included for the first time in 1973 and the above technique was not used. In 1974, the regular process was used and the resulting average age at entry was lower than that for the previous year. Therefore, the normal cost has decreased.

The above summary shows a slight deficiency in the actuarial balance for the Regular Group, but this deficiency is smaller in 1974 than in 1973. On the other hand, the actuarial balance for the Correctional Group changed from a tiny surplus to a small deficiency. The principal cause of this was a substantial increase in salaries, but, in addition, a number of state employees were classified as Correctional Employees for the first time, and some of them had long periods of service.

We believe that a deficiency of this size is not of importance, particularly in view of the interest earnings in excess of 5%. In fact, even with an interest rate of 5%, the time for full funding would be extended only to the year 2000.

We wish to direct attention to the fact that the report 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 23 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 41 years for the Regular Group and the 5% contribution does not cover interest on the Correctional Group's deficit; on a combined basis, the period would be 43 years. The report shows 21 years for the Regular Group and 28 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 increased from $159, 053, 467 to $163, 093, 236, an increase of $4, 039, 769. The MSRS Actuary gives the following analysis of this increase.

Increases:

Deviations in Salary Rates	$ 11, 157, 153	
Mortality Loss - Actives	158, 038	
Deviations in Termination Rates	26, 229	
Accrued Liability on New Entrants	925, 279	
Total Increases		$ 12, 266, 699

Decreases:

Amortization	$ 1, 142, 620	
Excess Investment Earnings	747, 929	
Mortality Gain - Retireds	336, 674	
Deviation in Retirement Rates	2, 150, 568	
Deviation in Disability Rates	128, 284	
New Normal Cost Rates	3, 720, 855	
Total Decreases		8, 226, 930

Net Increase	$ 4, 039, 769

3. Conclusion

The 1974 Valuation Report filed by MSRS conforms with the requirements of Chapter 249. However, we think the concluding statement on page 11 relative to the adequacy of support should have pointed out that it is based on the assumption that the employer's additional contribution will be applied to an increasing total payroll.

Franklin C. Smith
Associate, Society of Actuaries
GEORGE V. STENNES AND ASSOCIATES
Commission Actuaries