October 31, 1974

INTRODUCTION

Name of Association <u>Minnesota Highway Patrol Officers' Retirement Association</u>

In accordance with the pertinent chapters of Minnesota Laws, an actuarial valuation as of June 30, 1974, has been made of this Retirement Association. The valuation covers the membership of the fund as shown in the census of members and survivors of deceased members, which is included in this report. The details of the benefits under the Plan, assets in the fund, income of the fund, and membership data were furnished by the Administrator of this Plan.

This report covers the following items:

A. Benefits of the Plan and Contributions.

B. Assumptions in Actuarial Valuation.

C. Results of Valuation.

D. Discussion of Results.

E. Analysis of Change in the Unfunded Accrued Liability.

F. Census of Membership and Benefits as of June 30, 1974.

G. Analysis of Changes in Membership.

H. Average Ages at Entry and Retirement.

I. Certification by Actuary.

MINNESOTA HIGHWAY PATROL OFFICERS" RETIREMENT FUND

A. BENEFITS OF PLAN AND CONTRIBUTIONS

This Plan provides the following major benefits:

1. Retirement Benefit.

   a. Requirements for retirement:

      (1) Age 55 and 10 years of service required for full service benefit.

      (2) 10 years of service required for vesting of deferred annuity benefit with payments to start at age 55.

   b. Monthly Annuity:

      2 1/2% of average monthly salary for each year up to and including 20 years; 2% for each year of service in excess of 20.

   c. Average Monthly Salary:

      Average of highest 5 years.

2. Disability Benefit.

   a. Requirements:

      In Line of Duty: None.

      Not in Line of Duty: 5 years of service and age less than 55.

   b. Monthly Annuity:

      In Line of Duty: 50% of average monthly salary plus 2% for each year of service in excess of 20.

      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; a minimum of 25%.

3. Widow's and Orphan's Benefits.

a. Active Members:

(1) Death benefit before retirement:

Widow:	20% of average covered monthly salary
Orphans:	10% of average covered monthly salary to age 18 or 22 for each child plus $20 per month prorated equally to such children.

(Maximum total orphan benefit $400 per month.)

(2) Death benefit after retirement:

None (actuarial equivalent of life annuity may be chosen under an option to provide a widow's benefit). However, the widows of those members who retired or separated from the fund with vested benefits prior to July 1, 1965, will receive $156.25 per month.

b. Retired Members: None.

4. Other Death Benefit

(lump sum): None.

5. Termination of Employment Benefit:

Automatic refund without interest if less than 10 years of service. Must be requested if 10 years or more of service - otherwise vested after 10 years with the benefit payable at age 55. No refunds after 20 years of service.

6. Contributions:

Members:	8.0% of salary
Employer Regular:	12.0% of salary
Employer Additional:	10.0% of salary
Total	30.0% of salary

B. ASSUMPTIONS IN ACTUARIAL VALUATION

1. Mortality:	United States Life Tables, 1959-61 (White Males and White Females). These tables were used for both active and retired members, and for survivors.
2. Disability:	The rates of disability were adapted from experience of the New York State Employees' Retirement System, graduated and extrapolated as required for this valuation.
3. Withdrawal:	A rate of withdrawal of .030 at age 20 decreasing uniformly to zero at age 50 with no withdrawals after that age.
4. Salary Scale:	Salaries were assumed to increase 3 1/2% each year.
5. Retirement Age:	The assumed average ages at retirement for this fund were 57.0 for the Highway Patrol group and for the State Police Officers group hired after 6-30-61, and 62.5 for the State Police Officers group hired before 7-1-61.
6. Interest:	5%, compounded annually.

It is felt that these assumptions are appropriate for the valuation of this fund on a realistic basis.

C. RESULTS OF VALUATION

1.	Valuation	
	Normal Cost of Benefits	$ 1,622,689
	Administrative Expense	31,000
	Accrued Liability	40,779,112
2.	Current Deficit from Full Funding	
	Accrued Liability	$40,779,112
	Assets in Fund*	19,650,535
	Unfunded Accrued Liability	$21,128,577
3.	Annual Payment to Achieve Full Funding by 1997	
	Annual Deposit to Retire Deficit by 1997	$ 1,491,889
	Total Normal Cost	1,622,689
	Administrative Cost	31,000
	Total Annual Payment	$ 3,145,578
4.	Minimum Contribution to Prevent Increase in Deficit	
	Interest on Deficit at 5%	$ 1,056,429
	Total Normal Cost	1,622,689
	Administrative Expense	31,000
	Minimum Contribution	$ 2,710,118
5.	Income of Fund during Fiscal Year Ending June 30, 1974*	
	Members' Contributions	$ 762,498
	Taxes or Public Funds	2,088,163
	Total Contributions	$ 2,850,661
	Investment Income	$ 662,298
6.	Annual Payroll*	
	Total Projected Payroll, 1974-1975	$11,051,726

*Data furnished by Administrator. For valuation purposes, assets from Minnesota Adjustable Fixed Benefit Fund taken equal to reserves for benefits payable from this Fund plus the deficiency in the Annuity Stabilization Account.

D. DISCUSSION OF RESULTS

The valuation was made by a method known as the entry age normal cost method. Under this method, the normal cost is determined based on the age at hire of each member. This normal cost is the annual deposit required (using the assumptions outlined in Section B above) to pay for the cost of each member's prospective benefits over a period from his date of hire to his date of retirement. This normal cost is determined as a level percentage of payroll; therefore, future increases in payroll will produce increases in the number of dollars of normal cost.

The elements of normal cost for this plan are:

Type of Benefit	Normal Cost
Service Retirement Benefit	$1,021,467
Disability Benefit	310,189
Withdrawal Benefit	4,240
Survivor's Benefit	212,558
Vesting	74,235
Total Normal Cost	$1,622,689

This total normal cost and the administrative expense equal 14.96% of the total payroll as of June 30, 1974.

When a retirement plan is fully funded, the fund contains an amount equal to the accumulation (under the actuarial assumptions made) of the normal cost for each member from his date of hire to the date of the valuation. This accumulation is called the accrued liability or the required reserve.

The elements of accrued liability for this plan are:

Type of Benefit	Accrued Liability
1. Active Members	
Retirement Benefit	$28,034,676
Disability Benefit	2,466,205
Withdrawal Benefit	26,437
Survivor's Benefit	1,893,956
Vesting	878,541
Total for Active Members	$33,299,815
2. Inactive Members	
Retired	$ 4,720,633
Disabled	166,077
Deferred Retired	272,792
Widows	1,408,738
Orphans	106,933
Survivor's Benefit	804,124
Total for Inactive Members	$ 7,479,297
Total Accrued Liability	$40,779,112

A retirement plan which is fully funded requires future contributions no larger than the sum of the administrative expense and the normal costs for all active members to pay for the prospective benefits (if the assumptions made are realized exactly). To the extent that normal costs and administrative expenses have not been paid in the past, a plan is not fully funded. The amount by which the plan is short of full funding is called the unfunded accrued liability of the fund. In other words, the unfunded accrued liability is the excess of the accrued liability over the actual assets of the fund.

The amount of annual contribution which would be required to pay each year's normal cost, to pay the administrative expense and to eliminate the deficit by 1997 is the "total annual payment" shown in Section C of this report.

The deficit in the fund will increase unless at least 5% interest on the deficit is paid each year in addition to the normal cost and the administrative expenses. The sum of these three amounts should be regarded as the minimum annual contribution to the fund in order to keep the deficit at its present size. This "minimum contribution" is shown in Section C of this report.

E. ANALYSIS OF CHANGE IN THE UNFUNDED ACCRUED LIABILITY

As of 6-30-73		
Accrued Liability	$32,706,692	
Assets	16,132,905	
Unfunded Accrued Liability		$16,573,787
As of 6-30-74		
Accrued Liability	$40,779,112	
Assets	19,650,535	
Unfunded Accrued Liability		21,128,577
Increase in Unfunded Accrued Liability		$ 4,554,790
Increases:		
Change in Assumed Retirement Age *	$ 992,912	
Salary Scale Loss	4,141,779	
Mortality and Termination Loss - Actives	74,517	
Mortality Loss - MAFBF	41,300	
		$ 5,250,508
Decreases:		
Amortization Contribution	$ 592,991	
Excess Interest	97,352	
Capital Gain	5,375	
		695,718
		$ 4,554,790

*For State Police Officers hired after 7-1-61

F. CENSUS OF MEMBERSHIP AND BENEFITS AS OF JUNE 30, 1974

Status	Number	Annual Payroll
Active Members	738	$11,051,726

Status	Number	Annual Benefit
Service Retirements	133	$ 568,301
Disability Retirements	3	12,408
Widow Annuitants	61	136,688
Orphan Annuitants	34	29,045

Status	Number	Annual Benefit
Deferred Annuitants	13	$ 35,798

G. ANALYSIS OF CHANGES IN MEMBERSHIP

	Highway Patrol	State Police Officers
Active Members		
Number as of 6-30-73	504	231
New Entrants	3	22
Transfers from Deferred	0	0
Total	507	253
Deaths	2	1
Withdrawals with Vested Benefits	0	1
Withdrawals without Vested Benefits	3	5
Retired	5	4
Disabled	1	0
Total Terminations	11	11
Number as of 6-30-74	496	242
Service Retirements		
Number as of 6-30-73	86	43
Newly Retired	5	4
Transfer from Deferred Status	1	1
Transfer from Disabled Status	0	0
Total	92	48
Deaths	5	2
Number as of 6-30-74	87	46
Disabled Annuitants		
Number as of 6-30-73	1	1
Newly Disabled	1	0
Total	2	1
Transfer to Retired Status	0	0
Number as of 6-30-74	2	1

	Highway Patrol	State Police Officers
Widow Annuitants		
Number as of 6-30-73	31	23**
Newly Widowed	6	2
Total	37	25
Deaths	1	0
Remarried	0	0
Number as of 6-30-74	36	25
Orphan Annuitants		
Number as of 6-30-73	26	3
Newly Orphaned	6	1
Total	32	4
Orphans Attaining Maximum Age	1	1
Number as of 6-30-74	31	3
Deferred Annuitants		
Number as of 6-30-73	9*	6
New Deferred Annuitants	0	1
Total	9	7
Transfer to Retired Status	1	1
Transfer to Active Status	0	0
Deaths	1	0
Total Terminations	2	1
Number as of 6-30-74	7	6

* Includes one individual not reported in 1973
** Excludes one death not accounted for in 1973 membership figures

H. AVERAGE AGES AT ENTRY AND RETIREMENT

	Highway Patrol	State Police Officers
The average age at which employment commences is as follows:		
All Current Active Members	26.9	30.6
New Entrants Fiscal Year 1969-1970	26.0	30.2
1970-1971	25.4	30.9
1971-1972	25.0	27.6
1972-1973	24.1	30.8
1973-1974	33.9	26.7
The average age at which service retirements have taken place is as follows:		
All Current Service Retirements	57.5	64.7
New Retireds Fiscal Year 1969-1970	55.0	63.0
1970-1971	58.9	59.0
1971-1972	57.9	63.5
1972-1973	57.2	62.7
1973-1974	59.5	64.3

I. CERTIFICATION BY ACTUARY

Name of Association Minnesota Highway Patrol Officers' Retirement Association

We hereby certify that this actuarial valuation of the above named Association was made as of June 30, 1974, on the basis of accepted actuarial methods and procedures. The valuation was completed in accordance with the requirements of the pertinent chapters of Minnesota Laws.

Franklin C. Smith

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

HIGHWAY PATROLMEN VALUATION AS OF JUNE 30, 1974

The purpose of this memorandum is to discuss the valuation report of the Minnesota Highway Patrol Officers Retirement Association which was submitted to the Commission in accordance with Chapter 249 of Minnesota Laws 1967 and Chapter 289 of Minnesota Laws 1969. The valuation was made by our office using the entry age normal cost method and assuming 5% interest. The Plan includes the State Police officers as well as the members of the Highway Patrol.

This memorandum 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.

		June 30, 1973	June 30, 1974
(1)	Membership		
	Active Members	735	738
	Deferred Annuitants	15	13
	Retired Members	129	133
	Disabled Members	2	3
	Widows of Deceased Members	55	61
	Children of Deceased Members	29	34
(2)	Payroll and Annuities Payable	(Thousands of Dollars)	
	Total Payroll	$ 9, 036	$ 11, 052
	Annuities (annual)	539	746
(3)	Valuation Balance Sheet	(Thousands of Dollars)	
	Accrued Liability	$ 32, 707	$ 40, 779
	Assets	16, 133	19, 651
	Unfunded Accrued Liability (Deficit)	$ 16, 574	$ 21, 128
	Funding Ratio (Assets/Accrued Liability)	49.3%	48.2%

	June 30, 1973	June 30, 1974
(4) Normal Cost and Funding Costs	% of Payroll	% of Payroll
Normal Cost	14.34%	14.68%
Administrative Expense	0.18	0.28
Normal Cost plus Expense	14.52%	14.96%
Normal Cost plus Expense	14.52%	14.96%
Interest on Deficit	9.17	9.56
Total (Minimum Contribution)	23.69%	24.52%
Normal Cost plus Expense	14.52%	14.96%
Amortization by 1997	12.66	13.50
Total (Required Contribution)	27.18%	28.46%
(5) Statutory Contributions		
Employee	8.0%	8.0%
Employee Regular	12.0	12.0
Employer Additional	10.0	10.0
Total Contributions	30.0%	30.0%
(6) Investment Yield *	5.42%	5.85%

* Rate of return on mean assets excluding Minnesota Adjustable Fixed Benefit Fund.

2. Discussion of Valuation Results

The increases in cost come from two sources. First, since the conditions on retirement for State Police Officers hired after July 1, 1961 are the same as for Highway Patrolmen, we decided to value their benefits on the same assumed average retirement age as that used for Highway Patrolmen (57.0) rather than continuing to value them with the older State Police Officers for whom we assume an average retirement age of 62.5. This added almost $1,000,000 to the accrued liability.

In previous years, we have pointed out that the average age at retirement of the State Police Officers group would gradually decrease over the years. The change which was made this year replaces this gradual decrease for the entire group by a more realistic approach which divides the State Police Officers into two groups each with its own average retirement age. Under present conditions, we anticipate that these two average retirement ages will remain stabile.

The second source of increases in cost comes from a substantial increase in the total payroll. Salary increases exceeded the assumed rate, and the number of new entrants was relatively small which means that the bulk of the increases went to previous participants. This does not affect normal cost as a percentage of payroll, but it does produce an increase in the amortization contribution.

However, after the report had been written, it was discovered that the salary data were based on the last payroll period of the 1974 fiscal year in which numerous participants had received a special payment to cover compensatory time-off which had not been taken. This produced an overstatement of payroll to begin with, and then further overstatement resulted from a 6% adjustment in the reported salaries to factor in an increase which was effective in July.

It was our decision not to ask the fund to incur the expense of redoing the valuation. The total required contribution of 28.46% still falls under the 30% statutory contribution. A revaluation would produce about the same normal cost, and the main effect would be on the amortization contribution. We estimate that this figure would be reduced by 0.25% to 0.50%.

We direct attention also to the fact that the Salary Scale Loss figure shown in the analysis below is overstated on account of the problem with the salary data.

The unfunded accrued liability increased from $16,573,787 to $21,128,577 during the year, an increase of $4,554,790. The following is an approximate analysis of this change:

Increases:		
Change in Assumed Retirement Age*	$ 992,912	
Salary Scale Loss	4,141,779	
Mortality and Termination Loss - Actives	74,517	
Mortality Loss - MAFBF	41,300	
		$5,250,508
Decreases:		
Amortization Contribution	$ 592,991	
Excess Interest	97,352	
Capital Gain	5,375	
		695,718
		$4,554,790

* For State Police Officers hired after July 1, 1961.

3. Conclusion

In our opinion, the statutory contributions for this plan are sufficient to pay the normal cost each year and to retire the deficit by 1997. This opinion is based upon cost figures obtained by the entry age normal cost method and upon the valuation assumptions.

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