November 14, 1968

INTRODUCTION

Name of Association Minnesota Highway Patrol Officers' Retirement Association

In accordance with Chapter 359 of the 1965 Minnesota Laws and Chapter 249 of the 1967 Minnesota Laws, an actuarial survey as of June 30, 1968 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 Association.

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, 1968

G. Analysis of Changes in Membership.

H. Average Ages at Entry and Retirement.

I. Certification by Actuary.

A. BENEFITS OF PLAN AND CONTRIBUTIONS

This plan provides the following major benefits:

1. Retirement Benefit.

    a. Requirements for retirement:

        (1) Age 55 and 20 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 when minimum requirements are met:

        (1) $250 per month.

        (2) $125 per month.

    c. Additional monthly annuity after minimum requirements are met:

        (1) $5 per month for each year of service in excess of 20.

        (2) $12.50 per month for each year of service in excess of 10 (after 20 years of service, regular annuity as in (1) is granted.)

2. Disability Benefit.

    a. Requirements:

In Line of Duty:	None.
Not in Line of Duty:	10 years of service.

    b. Monthly Annuity:

    $250 per month plus $5 per month for each year of service in excess of 20.

3. <u>Widow's and Orphan's Benefits.</u>

a. Active members:

(1) Death benefit before retirement:

Widow:	$75 per month.
Orphans:	$45 per month to age 18 for each child plus $20 per month prorated equally to such children when there is more than one orphan.

(Maximum total orphan benefit $175 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 January 1, 1965 will receive $75 per month.

b. Retired member: None.

4. <u>Other Death Benefit</u> (lump sum): None.

5. <u>Termination of Employment Benefit</u>:

Member contributions returned without interest (except that after 10 years of service a deferred annuity may be elected).

6. <u>Contributions</u> (based on $6,000 annual salary limit):

Member:	7.0% of covered salary
Employer Regular:	11.2% of covered salary
Employer Additional:	9.0% of covered salary
Total	27.2% of covered 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:	No prediction of future salaries was necessary since the benefits are not based upon salary.
5.	Retirement Age:	The assumed average age at retirement for this fund was 57.1.
6.	Interest:	3%, 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	$ 398,328
Total Administrative Expense	4,666
Accrued Liability	8,843,554

2. Current Deficit from Full Funding.

Accrued Liability	$ 8,843,554
Assets in Fund *	4,927,531
Unfunded Accrued Liability	$ 3,916,023

3. Annual Payment to Achieve Full Funding by 1997.

Annual Deposit to Retire Deficit by 1997	$ 198,138
Total Normal Cost	398,328
Total Administrative Expense	4,666
Total Annual Payment	$ 601,132

4. Minimum Contribution to prevent increase in Deficit.

Interest on Deficit at 3%	$ 117,481
Total Normal Cost	398,328
Total Administrative Expense	4,666
Minimum Contribution	$ 520,475

5. *Income of Fund during fiscal year ending June 30, 1968.

Members' Contributions	$ 166,359
Taxes or Public Funds	479,860
Other	0
Total Contributions	$ 646,219
Investment Income	$ 191,693

6. *Annual Payroll.

Covered Payroll ($6,000 limit) as of 6-30-68	$ 2,376,554
Total Payroll (no limit) as of 6-30-68	$ 3,539,314

*Data furnished by Association.

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.

The elements of normal cost for this plan are:

Type of Benefit	Normal Cost
Service Retirement Benefit	$ 290,478
Disability Benefit	46,680
Withdrawal Benefit	1,274
Survivor's Benefit	41,003
Vesting	18,893
Total Normal Cost	$ 398,328

This total normal cost and the administrative expense total 17.0% of the total covered payroll as of June 30, 1968.

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	$ 5,110,215
Disability Benefit	281,463
Withdrawal Benefit	4,849
Survivor's Benefit	202,442
Vesting	196,737
Total for Active Members	$ 5,795,706
2. Inactive Members	
Retired	$ 1,995,551
Disabled	44,566
Deferred Retired	384,465
Widows	310,906
Orphans	56,745
Survivor's Benefit	255,615
Total for Inactive Members	$ 3,047,848
Total Accrued Liability	$ 8,843,554

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, the administrative expenses and 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 3% 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 6-30-67

Total Accrued Liability	$ 8,602,640	
Assets in Fund	4,306,145	
Unfunded Accrued Liability		$ 4,296,495

As of 6-30-68

Total Accrued Liability	$ 8,843,554	
Assets in Fund	4,927,531	
Unfunded Accrued Liability		$ 3,916,023

Decrease in Unfunded Accrued Liability		$ 380,472
Decrease Due to Correction of 1967 Survivor's Accrued Liability	$ 84,774	
Decrease Due to Gain from Actual Experience	171,906	
Decrease Due to Current Level of Contributions	123,792	
		$ 380,472

F. CENSUS OF MEMBERSHIP AND BENEFITS AS OF JUNE 30, 1968

Status	Number	Annual Payroll
Active Members	397	$ 2,376,554 ($6,000 limit)

Status	Number	Annual Benefit
Service Retirements	69	$ 184,147.08
Disabled Annuitants	1	3,180.00
Widow Annuitants	18	21,750.72
Orphan Annuitants	16	6,780.00
		$ 215,857.80

Status	Number	Annual Benefit
Deferred Annuitants	15	$ 32,514.00

G. ANALYSIS OF CHANGES IN MEMBERSHIP

Active Members

Number as of 6-30-67	386
New Entrants	27
Total	413
Deaths	2
Withdrawals with Vested Benefits	4
Withdrawals without Vested Benefits	8
Retired	2
Total Terminations	16
Number as of 6-30-68	397

Service Retirements

Number as of 6-30-67	65
Newly Retired	2
Transferred from Deferred Status	3
Total	70
Deaths	1
Number as of 6-30-68	69

Disabled Annuitants

Number as of 6-30-67	1
Newly Disabled	0
Total	1
Number as of 6-30-68	1

Widows Annuitants

Number as of 6-30-67	16
Newly Widowed	2
Total	18
Widows Remarrying	0
Number as of 6-30-68	18

Orphan Annuitants

Number as of 6-30-67	17
Newly Orphaned	0
Total	17
Orphans Attaining Age 18	1
Number as of 6-30-68	16

Deferred Annuitants

Number as of 6-30-67	15
New Deferred Annuitants	4
Total	19
Transferred to Retired Status	3
Deaths	1
Number as of 6-30-68	15

H. AVERAGE AGES AT ENTRY AND RETIREMENT

The average age at which employment commences is as follows:

All Current Members		27.3
New Entrants Fiscal Year	1963-1964	24.9
	1964-1965	26.0
	1965-1966	27.5
	1966-1967	26.5
	1967-1968	25.9

The average age at which service retirements have taken place is as follows:

All Current Service Retirements		57.1
New Retireds Fiscal Year	1963-1964	55.2
	1964-1965	58.4
	1965-1966	56.8
	1966-1967	58.9
	1967-1968	60.5

I. CERTIFICATION BY ACTUARY

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

We hereby certify that this actuarial survey of the above named Association was made as of June 30, 1968, on the basis of accepted actuarial methods and procedures. The survey was completed in accordance with the requirements of Chapter 359 of Minnesota Laws 1965 and Chapter 249 of Minnesota Laws 1967.

Franklin C. Smith

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

GVS Minnesota Memorandum No. 68-5
November 22, 1968

HIGHWAY PATROLMEN VALUATION AS OF JUNE 30, 1968

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. The valuation was made by our office using the entry age normal cost method and assuming 3% interest.

This memorandum contains the following:

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

Reference can be made to our report of January 19, 1968 for a similar discussion of the actuarial valuation as of June 30, 1967.

1. Statistical and Valuation Data

Results of the valuation reports as of June 30, 1967 and June 30, 1968 are shown for comparative purposes. Figures are rounded where necessary for simplicity of presentation.

(1) Membership	June 30, 1967	June 30, 1968
Active Members	386	397
Deferred Annuitants	15	15
Retired Members	65	69
Disabled Members	1	1
Widows of Deceased Members	16	18
Children of Deceased Members	17	16

(2) Payroll and Annuities Payable	(Thousands of Dollars)	
Total Payroll (no limit)	$2,594	$3,539
Covered Payroll ($6,000 limit)	2,300	2,377
Annuities (Annual)	199	216

(3) Valuation Balance Sheet	(Thousands of Dollars)	
Accrued Liability	$8,603	$8,844
Assets	4,306	4,928
Unfunded Accrued Liability (Deficit)	$4,297	$3,916
Funding Ratio (Assets/Accrued Liability)	50%	55.7%

(4) Normal Cost and Funding Costs

	June 30, 1967	% of Covered Payroll	June 30, 1968	% of Covered Payroll
Normal Cost	$392,772	17.1%	$398,328	16.8%
Administrative Expense	4,175	0.2	4,666	0.2
Normal Cost Plus Expense	$396,947	17.3%	$402,994	17.0%
Normal Cost Plus Expense	$396,947	17.3%	$402,994	17.0%
Interest on Deficit	128,895	5.6	117,481	4.9
Total (Min. Contribution)	$525,842	22.9%	$520,475	21.9%
Normal Cost Plus Expense	$396,947	17.3%	$402,994	17.0%
Amortization by 1997	212,819	9.3	198,138	8.3
Total (Required Cont.)	$609,766	26.6%	$601,132	25.3%

(5) Statutory Contributions

	June 30, 1967	June 30, 1968
Employee	7.0%	7.0%
Employer Regular	11.2	11.2
Employer Additional	9.0	9.0
Total Contributions	27.2%	27.2%

(6) Investment Yield*

	June 30, 1967	June 30, 1968
Investment Yield*	3.9%	4.2%

*Ratio of reported investment income to mean reported assets.

2. Discussion of Valuation Results

Since the benefits under this plan are not related to compensation but consist of a stated number of dollars for a participant who qualifies, the amount of covered salary is used only for the purpose of determining the amount of contributions to the fund. Therefore, unlike the other statewide funds, the ceiling on covered salary was not removed during the 1967 Session of the Legislature.

The normal cost as a percentage of covered payroll declined slightly from 17.1% to 16.8%. The average age of new entrants during the 1967-1968 fiscal year was 25.9 compared with 26.5 during the previous fiscal year. This caused a small reduction in the average entry age of the entire group. At the same time, the total covered payroll as well as the average covered compensation per member increased. The combination has produced the decrease in the normal cost as a percentage of payroll.

During the 1967-1968 fiscal year, the unfunded accrued liability decreased from $4,296,495 to $3,916,023, a decrease of $380,472. This decrease may be broken down as follows:

Decrease from Correction of 1967 Survivors' Accrued Liability	$ 84,774
Decrease from Actuarial Gains	171,906
Decrease from Amortization	123,792
	$380,472

The 1967 Legislature provided a post retirement widows' benefit for those members who retired or terminated with vested benefits prior to January 1, 1965. After the 1967 Actuarial Valuation was filed, it was discovered that all retirees and deferred annuitants had been used in calculating the reserve for this benefit rather than only those entering these positions prior to January 1, 1965. The first item above is the overstatement of the reserve from this error.

The actuarial gains resulted from investment earnings of 4.2% compared with an assumed rate of 3% and from deaths and terminations in excess of the assumed number.

The required contribution of 25.3% of payroll is below the current statutory rate of 27.2%. The current level of funding should retire the deficit by 1989 or 1990.

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 before 1997. This opinion is based upon cost figures obtained by the entry age normal cost method and upon our valuation assumptions and the benefits provided by the plan as of June 30, 1968.

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