June 30, 1969

INTRODUCTION

Name of Association Minnesota Highway Patrol Officers' Retirement Association

In accordance with Chapter 359 of the 1965 Minnesota Laws, Chapter 249 of the 1967 Minnesota Laws, and Chapter 289 of the 1969 Minnesota Laws, an actuarial survey as of June 30, 1969 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, 1969.

G. Analysis of Changes in Membership.

H. Average Ages at Entry and Retirement.

I. Results of Valuation Based upon 3% Interest Assumption.

J. 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 covered monthly salary for each year up to and including 20 years; 2% for each year of service in excess of 20.

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 covered monthly salary plus 2% for each year of service in excess of 20.
Not in Line of Duty:	2 1/2% of average covered 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:	8% of average covered monthly salary to age 18 for each child plus $20 per month prorated equally to such children.

(Maximum total orphan benefit $200 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. 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 with the benefit at age 55. No refunds after 20 years of service.

6. Contributions:

Member:	7.0% of salary
Employer Regular:	11.2% of salary
Employer Additional:	8.0% of salary
Total	26.2% 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% each year.
5.	Retirement Age:	The assumed average age at retirement for this fund was 57.3.
6.	Interest:	3 1/2%, 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	$ 539,991
Administrative Expense	2,892
Accrued Liability	12,590,841

2. Current Deficit from Full Funding.

Accrued Liability	$12,590,841
Assets in Fund *	5,618,508
Unfunded Accrued Liability	$ 6,972,333

3. Annual Payment to Achieve Full Funding by 1997.

Annual Deposit to Retire Deficit by 1997	$ 381,317
Total Normal Cost	539,991
Administrative Expense	2,892
Total Annual Payment	$ 924,200

4. Minimum Contribution to Prevent Increase in Deficit.

Interest on Deficit at 3.5%	$ 244,032
Total Normal Cost	539,991
Administrative Expense	2,892
Minimum Contribution	$ 786,915

5. *Income of Fund during Fiscal Year Ending June 30, 1969.

Members' Contributions	$ 180,857
Taxes or Public Funds	521,900
Other	0
Total Contributions	$ 702,757
Investment Income	$ 221,822

6. *Annual Payroll.

Total Payroll as of 6-30-69	$ 3,545,474

* 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. 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	$ 375,389
Disability Benefit	79,400
Withdrawal Benefit	1,254
Survivor's Benefit	57,978
Vesting	25,970
Total Normal Cost	$ 539,991

This total normal cost and the administrative expense equal 15.31% of the total payroll as of June 30, 1969.

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	$ 8,296,051
Disability Benefit	620,462
Withdrawal Benefit	5,887
Survivor's Benefit	403,018
Vesting	323,861
Total for Active Members	$ 9,649,279
2. Inactive Members	
Retired	$ 2,042,222
Deferred Retired	251,802
Widows	359,311
Orphans	72,358
Survivor's Benefit	215,869
Total for Inactive Members	$ 2,941,562
Total Accrued Liability	$ 12,590,841

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 1/2% 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 6-30-68

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

As of 6-30-69

Total Accrued Liability		$ 12,590,841	
Assets in Fund		5,618,508	
Unfunded Accrued Liability			$ 6,972,333

Increase in Unfunded Accrued Liability			$ 3,056,310
Increase Due to Improvement in Benefits		$ 4,354,813	
Decrease Due to Change in Assumed Interest Rate	$964,718		
Decrease Due to Gain from Actual Experience	149,707		
Decrease Due to Amortization Contribution	184,078	1,298,503	
			$ 3,056,310

F. CENSUS OF MEMBERSHIP AND BENEFITS AS OF JUNE 30, 1969

Status	Number	Annual Payroll
Active Members	427	$ 3,545,474

Status	Number	Annual Benefit
Service Retirements	74	$ 198,934.92
Widow Annuitants	22	27,056.28
Orphan Annuitants	22	8,640.00
		$ 234,631.20

Status	Number	Annual Benefit
Deferred Annuitants	12	$ 22,410.60

G. ANALYSIS OF CHANGES IN MEMBERSHIP

Active Members

Number as of 6-30-68	397
Transfer to Actives from Deferred Status	1
New Entrants	36
Total	434
Deaths	1
Withdrawals with Vested Benefits	2
Withdrawals without Vested Benefits	2
Retired	2
Total Terminations	7
Number as of 6-30-69	427

Service Retirements

Number as of 6-30-68	69
Newly Retired	2
Transfer from Deferred Status	4
Transfer from Disabled Status	1
Total	76
Deaths	2
Number as of 6-30-69	74

Disabled Annuitants

Number as of 6-30-68	1
Newly Disabled	0
Total	1
Transfer to Retired Status	1
Number as of 6-30-69	0

Widows Annuitants

Number as of 6-30-68	18
Newly Widowed	4
Total	22
Widows Remarrying	0
Number as of 6-30-69	22

Orphan Annuitants

Number as of 6-30-68	16
Newly Orphaned	7
Total	23
Orphans Attaining Age 18	1
Number as of 6-30-69	22

Deferred Annuitants

Number as of 6-30-68	15
New Deferred Annuitants	2
Total	17
Transfer to Retired Status	4
Transfer to Active Status	1
Deaths	0
Number as of 6-30-69	12

H. AVERAGE AGES AT ENTRY AND RETIREMENT

The average age at which employment commences is as follows:

All Current Members		27.2
New Entrants Fiscal Year	1964-1965	26.0
	1965-1966	27.5
	1966-1967	26.5
	1967-1968	25.9
	1968-1969	26.4

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

All Current Service Retirements		57.3
New Retireds Fiscal Year	1964-1965	58.4
	1965-1966	56.8
	1966-1967	58.9
	1967-1968	60.5
	1968-1969	56.7

I. RESULTS OF VALUATION BASED UPON 3% INTEREST ASSUMPTION

Chapter 289 of the 1969 Minnesota Laws requires that for purposes of comparison a valuation be made using a 3% interest assumption as well as a 3 1/2% interest assumption. The results under the 3% interest assumption are as follows:

1. Valuation.

Normal Cost of Benefits	$ 598,359
Administration Expense	2,892
Accrued Liability	13,555,559

2. Current Deficit from Full Funding.

Accrued Liability	$13,555,559
Assets in Fund *	5,618,508
Unfunded Accrued Liability	$ 7,937,051

3. Annual Payment to Achieve Full Funding by 1997.

Annual Deposit to Retire Deficit by 1997	$ 410,663
Total Normal Cost	598,359
Administrative Expense	2,892
Total Annual Payment	$1,011,914

4. Minimum Contribution to Prevent Increase in Deficit.

Interest on Deficit at 3.5%	$ 238,112
Total Normal Cost	598,359
Administrative Expense	2,892
Minimum Contribution	$ 839,363

* Data furnished by Association.

J. CERTIFICATION BY ACTUARY

Name of Association Minnesota Highway Patrol Officers' Retirement Association

We hereby certify that this actuarial survey of the above named Association was made as of June 30, 1969, 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, Chapter 249 of Minnesota Laws 1967 and Chapter 289 of Minnesota Laws 1969.

Franklin C. Smith

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

GVS Minnesota Memorandum No. 69-5
December 19, 1969

STATE POLICE OFFICERS VALUATION AS OF JUNE 30, 1969

The purpose of this memorandum is to discuss the valuation report of the Minnesota State Police 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 on the basis of the entry age normal cost method and assuming 3 1/2% interest. The 1968 valuation was prepared by Rodger R. Patrick of Hewitt Associates, and the current one by our firm.

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, 1968 and June 30, 1969 are shown for comparative purposes. Figures are rounded where necessary for simplicity of presentation.

	As of June 30, 1968	As of June 30, 1969
(1) Membership		
Active Members	169	184
Retired Members	41	39
Disabled Members	1	0
Widows of Deceased Members	25	27
Children of Deceased Members	10	10
Deferred Annuitants	4	4
(2) Payroll and Annuities Payable	(Thousands of Dollars)	
Covered Payroll	$ 1,487	$ 1,716
Annuities (Annual)	134	129
(3) Valuation Balance Sheet	(Thousands of Dollars)	
Accrued Liability	$ 4,050	$ 5,318
Assets	1,604	1,885
Unfunded Accrued Liability (Deficit)	$ 2,446	$ 3,433
Funding Ratio (Assets/Accrued Liability)	39.6%	35.4%

	As of June 30, 1968	As of June 30, 1969
(4) Normal Costs and Funding Costs		
	Percent of Payroll	Percent of Payroll
Normal Cost	11.7%	13.06%
Expenses	0.2	0.46
	11.9%	13.52%
Normal Cost Plus Expenses	11.9%	13.52%
Interest on Deficit	4.8	7.00
Minimum Contribution	16.7%	20.52%
Normal Cost Plus Expenses	11.9%	13.52%
Amortization by 1997	8.3	10.94
Required Contribution	20.2%	24.46%
(5) Statutory Contributions		
Employee	6.0%	7.0%
Employer Regular	9.0	11.2
Employer Additional	6.5	8.0
Total	21.5%	26.2%
(6) Estimated Investment Yield*	3.99%	3.96%

*Ratio of reported investment income to estimated mean assets for fiscal year.

2. Discussion of Valuation Results

Important changes were made by the 1969 Legislature. The State Police Officers Retirement System was merged with the Highway Patrol System with the same benefit formula applicable to all participants. Although the State Police Officers plan already provided a percentage of average salary as a benefit, the change produced an improvement in the percentage.

At the same time, the new legislation changed the assumed interest rate from 3% to 3 1/2%.

The above changes produced an increase of $987,239 in the unfunded accrued liability. This may be broken down as follows:

Increases:		
From Improvement in Benefits	$ 1,986,012	
From Change in Valuation Age	245,391	
Total Increases		$ 2,231,403
Decreases:		
From Actuarial Gains and Changes in Methods	$ 782,227	
From Amortization Contribution	123,145	
From Change in Assumed Interest Rate	338,792	
Total Decreases		1,244,164
Net Increase		$ 987,239

The first decrease item of $782,227 results from interest earnings of 3.96% compared with an assumed rate of 3%, from terminations and retired deaths in excess of the number assumed, and from a difference in the assumptions and methods used to calculate the cost of the disability and survivors benefits on the two valuation dates.

For purposes of comparison, the 1969 results on a 3% interest assumption are given below:

Accrued Liability	$ 5,657	Normal Cost	14.27%
Assets	1,885	Expenses	0.46
Unfunded Accrued Liability	$ 3,772		14.73%
		Amortization by	
Funding Ratio	33.3%	1997	11.37
			26.10%

3. Conclusion

The Valuation Report complies with the requirements of the various statutes and indicates that the current statutory contribution is somewhat in excess of the required amount.

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

December 1, 1969

INTRODUCTION

Name of Association: Minnesota State Police Officers' Retirement Association

In accordance with Chapter 359 of the 1965 Minnesota Laws, Chapter 249 of the 1967 Minnesota Laws, and Chapter 289 of the 1969 Minnesota Laws, an actuarial survey as of June 30, 1969 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, 1969.

G. Analysis of Changes in Membership.

H. Average Ages at Entry and Retirement.

I. Results of Valuation Based upon 3% Interest Assumption.

J. Certification by Actuary.

MINNESOTA STATE POLICE 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 covered monthly salary for each year up to and including 20 years; 2% for each year of service in excess of 20.

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 covered monthly salary plus 2% for each year of service in excess of 20.
Not in Line of Duty:	2 1/2% of average covered 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:	8% of average covered monthly salary to age 18 for each child plus $20 per month prorated equally to such children.

(Maximum total orphan benefit $200 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).

b. Retired member: 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 with the benefit at age 55. No refunds after 20 years of service.

6. Contributions:

Member:	7.0% of salary
Employer Regular:	11.2% of salary
Employer Additional:	8.0% of salary
Total	26.2% 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% each year.
5.	Retirement Age:	The assumed average age at retirement for this fund was 62.5.
6.	Interest:	3 1/2%, 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	$ 224,119
Administrative Expense	7,906
Accrued Liability	5,317,712

2. Current Deficit from Full Funding.

Accrued Liability	$ 5,317,712
Assets in Fund *	1,884,645
Unfunded Accrued Liability	3,433,067

3. Annual Payment to Achieve Full Funding by 1997.

Annual Deposit to Retire Deficit by 1997	$ 187,754
Total Normal Cost	224,119
Administrative Expense	7,906
Total Annual Payment	$ 419,779

4. Minimum Contribution to Prevent Increase in Deficit.

Interest on Deficit at 3.5%	$ 120,157
Total Normal Cost	224,119
Administrative Expense	7,906
Minimum Contribution	$ 352,182

5. *Income of Fund during Fiscal Year Ending June 30, 1969.

Members' Contributions	$ 102,949
Taxes or Public Funds	265,441
Other	0
Total Contributions	$ 368,390
Investment Income	$ 67,791

6. *Annual Payroll.

Total Payroll as of 6-30-69	$ 1,715,810

* 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. 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	$ 150,925
Disability Benefit	34,272
Withdrawal Benefit	440
Survivor's Benefit	32,538
Vesting	5,944
Total Normal Cost	$ 224,119

This total normal cost and the administrative expense equal 13.52% of the total payroll as of June 30, 1969.

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	$ 3,543,548
Disability Benefit	247,447
Withdrawal Benefit	2,005
Survivor's Benefit	322,007
Vesting	48,841
Total for Active Members	$ 4,163,848
2. Inactive Members	
Retired	$ 702,995
Deferred Retired	73,296
Widows	278,778
Orphans	23,235
Survivor's Benefit	75,560
Total for Inactive Members	$ 1,153,864
Total Accrued Liability	$ 5,317,712

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 1/2% 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 6-30-68

Total Accrued Liability	$ 4,049,939	
Assets in Fund	1,604,111	
Unfunded Accrued Liability		$ 2,445,828

As of 6-30-69

Total Accrued Liability	$ 5,317,712	
Assets in Fund	1,884,645	
Unfunded Accrued Liability		3,433,067

Increase in Unfunded Accrued Liability	$ 987,239

Increases:			
From Improvement in Benefits	$ 1,986,012		
From Change in Valuation Age	245,391		
		$ 2,231,403	
Decreases:			
From Change in Assumed Interest Rate	$ 338,792		
From Actuarial Gains and Change in Methods	782,227		
From Amortization Contribution	123,145		
		1,244,164	
			$ 987,239

F. CENSUS OF MEMBERSHIP AND BENEFITS AS OF JUNE 30, 1969

Status	Number	Annual Payroll
Active Members	184	$ 1,715,810

Status	Number	Annual Benefit
Service Retirements	39	$ 95,675.40
Widow Annuitants	27	26,275.56
Orphan Annuitants	10	7,320.00
		$ 129,270.96

Status	Number	Annual Benefit
Deferred Annuitants	4	$ 4,961.44

G. ANALYSIS OF CHANGES IN MEMBERSHIP

Active Members

Number as of 6-30-68	169
New Entrants	24
Total	193
Deaths	0
Withdrawals without Vested Benefits	8
Retired	1
Total Terminations	9
Number as of 6-30-69	184

Service Retirements

Number as of 6-30-68	41
Newly Retired	1
Transfer from Disabled Status	1
Total	43
Deaths	4
Number as of 6-30-69	39

Disabled Annuitants

Number as of 6-30-68	1
Newly Disabled	0
Total	1
Transfer to Retired Status	1
Number as of 6-30-69	0

Widows Annuitants

Number as of 6-30-68	25
Newly Widowed	2
Total	27
Widows Remarrying	0
Number as of 6-30-69	27

Orphan Annuitants

Number as of 6-30-68	10
Newly Orphaned	0
Total	10
Orphans Attaining Age 18	0
Number as of 6-30-69	10

Deferred Annuitants

Number as of 6-30-68	4
New Deferred Annuitants	0
Total	4
Transfer to Retired Status	0
Deaths	0
Number as of 6-30-69	4

H. AVERAGE AGES AT ENTRY AND RETIREMENT

The average age at which employment commences is as follows:

All Current Members		31.6
New Entrants Fiscal Year	1964-1965	27.4
	1965-1966	29.9
	1966-1967	38.0
	1967-1968	NA
	1968-1969	33.0

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

All Current Service Retirements		66.8
New Retireds Fiscal Year	1964-1965	66.0
	1965-1966	67.5
	1966-1967	66.0
	1967-1968	69.0
	1968-1969	65.0

I. RESULTS OF VALUATION BASED UPON 3% INTEREST ASSUMPTION

Chapter 289 of the 1969 Minnesota Laws requires that for purposes of comparison a valuation be made using a 3% interest assumption as well as a 3 1/2% interest assumption. The results under the 3% interest assumption are as follows:

1. Valuation.

Normal Cost of Benefits	$ 244,853
Administration Expense	7,906
Accrued Liability	5,656,504

2. Current Deficit from Full Funding.

Accrued Liability	$ 5,656,504
Assets in Fund *	1,884,645
Unfunded Accrued Liability	$ 3,771,859

3. Annual Payment to Achieve Full Funding by 1997.

Annual Deposit to Retire Deficit by 1997	$ 195,155
Total Normal Cost	244,853
Administrative Expense	7,906
Total Annual Payment	$ 447,914

4. Minimum Contribution to Prevent Increase in Deficit.

Interest on Deficit at 3.0%	$ 113,156
Total Normal Cost	244,853
Administrative Expense	7,906
Minimum Contribution	$ 365,915

* Data furnished by Association.

J. CERTIFICATION BY ACTUARY

Name of Association: Minnesota State Police Officers' Retirement Association

We hereby certify that this actuarial survey of the above named Association was made as of June 30, 1969, 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, Chapter 249 of Minnesota Laws 1967 and Chapter 289 of Minnesota Laws 1969.

Franklin C. Smith

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

GVS Minnesota Memorandum No. 69-4
December 19, 1969

HIGHWAY PATROLMEN VALUATION AS OF JUNE 30, 1969

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 3 1/2% interest.

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, 1968 and June 30, 1969 are shown for comparative purposes. Figures are rounded where necessary for simplicity of presentation.

(1) Membership	June 30, 1968	June 30, 1969
Active Members	397	427
Deferred Annuitants	15	12
Retired Members	69	74
Disabled Members	1	0
Widows of Deceased Members	18	22
Children of Deceased Members	16	22

(2) Payroll and Annuities Payable	(Thousands of Dollars)	
Total Payroll (no limit)	$3,539	$3,545
Covered Payroll ($6,000 limit in 1968)	2,377	3,545
Annuities (annual)	216	235

(3) Valuation Balance Sheet	(Thousands of Dollars)	
Accrued Liability	$8,844	$12,591
Assets	4,928	5,619
Unfunded Accrued Liability (Deficit)	$3,916	$ 6,972
Funding Ratio (Assets/ Accrued Liability)	55.7%	44.6%

(4) Normal Cost and Funding Costs

	June 30, 1968 % of Payroll	June 30, 1969 % of Payroll
Normal Cost	16.8%	15.23%
Administrative Expense	0.2	0.08
Normal Cost Plus Expense	17.0%	15.31%
Normal Cost Plus Expense	17.0%	15.31%
Interest on Deficit	4.9	6.88
Total (Min. Contribution)	21.9%	22.19%
Normal Cost Plus Expense	17.0%	15.31%
Amortization by 1997	8.3	10.75
Total (Required Cont.)	25.3%	26.06%

(5) Statutory Contributions

Employee	7.0%	7.0%
Employer Regular	11.2	11.2
Employer Additional	9.0	8.0
Total Contributions	27.2%	26.2%

(6) Investment Yield *	4.2%	4.3%

* Ratio of reported investment income to mean reported assets.

2. Discussion of Valuation Results

The figures given above for 1968 and 1969 are almost impossible to compare. The 1969 Legislature changed the benefit structure from a flat number of dollars related to a $6,000 annual salary to a percentage of average salary formula without any ceiling on covered salary.

With the new type of benefit formula, we felt that it was appropriate to introduce an assumption as to future increases in salary and to determine normal cost as a level percentage of a payroll assumed to increase in a like manner.

At the same time, the new legislation changed the assumed interest rate from 3% to 3 1/2%.

The above changes have combined to produce an increase of $3,056,310 in the unfunded accrued liability. This may be broken down as follows:

Increases:

From Improvement in Benefits		$4,354,813

Decreases:

From Actuarial Gains	$149,707	
From Amortization Contribution	184,078	
From Change in Assumed Interest Rate	964,718	
Total Decreases		1,298,503
Net Increase		$3,056,310

Most of the actuarial gain arose from investment earnings of 4.3% compared with an assumed rate of 3%. In future years, this margin will be narrowed by 0.5%, and the opportunity for excess interest on the reserves for retired lives will be lost.

For purposes of comparison, the 1969 results on a 3% interest assumption are given below:

Accrued Liability	$13,556
Assets	5,619
Unfunded Accrued Liability	$ 7,937

Normal Cost	16.88%
Expenses	0.08
	16.96%
Amortization by 1997	11.58
	28.54%

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 our valuation assumptions and the benefits provided by the plan as of June 30, 1969.

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GEORGE V. STENNES AND ASSOCIATES
Commission Actuaries