

9/10
November 23, 1970

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 valuation as of June 30, 1970 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, 1970.
- G. Analysis of Changes in Membership.
- H. Average Ages at Entry and Retirement.
- I. Certification by Actuary.

Proposal:
1. joint and survivor benefit



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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:	<u>8.0%</u> of salary	✓
Total	26.2% of salary	

→ 18.2

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 extra-
polated 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 $3\frac{1}{2}\%$
each year.
5. Retirement Age: The assumed average ages at retirement
for this fund were 57.1 for the Highway
Patrol group and 62.5 for the State Police
Officers group.
6. Interest: $3\frac{1}{2}\%$, 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	\$ 896,728
Administrative Expense	6,185
Accrued Liability	21,119,778

2. Current Deficit from Full Funding.

Accrued Liability	\$ 21,119,778
Assets in Fund *	9,098,829
Unfunded Accrued Liability	\$ 12,020,949

3. Annual Payment to Achieve Full Funding by 1997.

Annual Deposit to Retire Deficit by 1997	\$ 671,924
Total Normal Cost	896,728
Administrative Expense	6,185
Total Annual Payment	\$ 1,574,837

4. Minimum Contribution to Prevent Increase in Deficit.

Interest on Deficit at 3.5%	\$ 420,733
Total Normal Cost	896,728
Administrative Expense	6,185
Minimum Contribution	\$ 1,323,646

5. Income of Fund during Fiscal Year Ending June 30, 1970.*

Members' Contributions	\$ 458,547
Taxes or Public Funds	1,246,093
Other	0
Total Contributions	\$ 1,704,640
Investment Income	\$ 267,855

6. Annual Payroll.*

Total Payroll as of 6-30-70	\$ 6,550,665
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*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:

<u>Type of Benefit</u>	<u>Normal Cost</u>
Service Retirement Benefit	\$ 606,297
Disability Benefit	139,977
Withdrawal Benefit	2,317
Survivor's Benefit	107,641
Vesting	<u>40,496</u>
Total Normal Cost	\$ 896,728

This total normal cost and the administrative expense equal 13.69% of the total payroll as of June 30, 1970.

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:

<u>Type of Benefit</u>	<u>Accrued Liability</u>
1. <u>Active Members</u>	
Retirement Benefit	\$ 13,580,616
Disability Benefit	1,095,865
Withdrawal Benefit	10,436
Survivor's Benefit	913,715
Vesting	<u>445,131</u>
Total for Active Members	\$ 16,045,763
2. <u>Inactive Members</u>	
Retired	\$ 2,935,955
Deferred Retired	301,467
Widows	693,581
Orphans	96,770
Survivor's Benefit	<u>1,046,242</u>
Total for Inactive Members	\$ 5,074,015
Total Accrued Liability	\$ 21,119,778

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 6-30-69

Total Accrued Liability	\$ 17, 908, 553	
Assets in Fund	<u>7, 503, 153</u>	
Unfunded Accrued Liability		\$ 10, 405, 400

As of 6-30-70

Total Accrued Liability	\$ 21, 119, 778	
Assets in Fund	<u>9, 098, 829</u>	
Unfunded Accrued Liability		\$ 12, 020, 949

Increase in Unfunded Accrued Liability		\$ 1, 615, 549
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Increase Due to Salary Scale
Loss & Change in Assumption \$ 1, 631, 265

Increase Due to Corrections in Retired Widows Data	<u>622, 386</u>	\$ 2, 253, 651
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Increase Due to Amortization Contribution	\$ 560, 724	
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Decrease Due to Excess Interest and Capital Gain	<u>77, 378</u>	\$ <u>638, 102</u>
		\$ 1, 615, 549

F. CENSUS OF MEMBERSHIP AND BENEFITS AS OF JUNE 30, 1970

<u>Status</u>	<u>Number</u>	<u>Annual Payroll</u>
Active Members	651	\$ 6, 550, 655

<u>Status</u>	<u>Number</u>	<u>Annual Benefit</u>
Service Retirements	116	\$ 311, 193
Disability Retirements	1	3, 684
Widow Annuitants	51	57, 523
Orphan Annuitants	36	<u>17, 020</u>
		\$ 389, 420

<u>Status</u>	<u>Number</u>	<u>Annual Benefit</u>
Deferred Annuitants	15	\$ 29, 535

G. ANALYSIS OF CHANGES IN MEMBERSHIP

	<u>Highway Patrol</u>	<u>State Police Officers</u>
<u>Active Members</u>		
Number as of 6-30-69	428 *	184
New Entrants	<u>33</u>	<u>24</u>
Total	461	208
Deaths	2	0
Withdrawals with Vested Benefits	1	4
Withdrawals without Vested Benefits	2	3
Retired	0	5
Disabled	<u>1</u>	<u>0</u>
Total Terminations	6	12
Number as of 6-30-70	455	196
*Corrected for an omission in 1969.		
<u>Service Retirements</u>		
Number as of 6-30-69	74	39
Newly Retired	0	5
Transfer from Deferred Status	2	0
Transfer from Disabled Status	<u>0</u>	<u>0</u>
Total	76	44
Deaths	2	2
Number as of 6-30-70	74	42
<u>Disabled Annuitants</u>		
Number as of 6-30-69	0	0
Newly Disabled	<u>1</u>	<u>0</u>
Total	1	0
Transfer to Retired Status	0	0
Number as of 6-30-70	1	0

	<u>Highway Patrol</u>	<u>State Police Officers</u>
<u>Widow Annuitants</u>		
Number as of 6-30-69	22	27
Newly Widowed	<u>3</u>	<u>2</u>
Total	25	29
Deaths	0	3
Number as of 6-30-70	25	26
<u>Orphan Annuitants</u>		
Number as of 6-30-69	22	10
Newly Orphaned	<u>4</u>	<u>0</u>
Total	26	10
Orphans Attaining Age 18	0	0
Number as of 6-30-70	26	10
<u>Deferred Annuitants</u>		
Number as of 6-30-69	12	4
New Deferred Annuitants	<u>1</u>	<u>3</u>
Total	13	7
Transfer to Retired Status	2	1
Refunds	2	0
Deaths	<u>0</u>	<u>0</u>
Total Terminations	4	1
Number as of 6-30-70	9	6

H. AVERAGE AGES AT ENTRY AND RETIREMENT

	<u>Highway Patrol</u>	<u>State Police Officers</u>
The average age at which employment commences is as follows:		
All Current Members	27.3	31.0
New Entrants Fiscal Year 1965-1966	27.5	29.9
1966-1967	26.5	38.0
1967-1968	25.9	N.A.
1968-1969	26.4	33.0
1969-1970	26.0	30.2

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

All Current Service Retirements	57.1	66.5
New Retireds Fiscal Year 1965-1966	56.8	67.5
1966-1967	58.9	66.0
1967-1968	60.5	69.0
1968-1969	56.7	65.0
1969-1970	55.0	63.0

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, 1970, 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

HIGHWAY PATROLMEN VALUATION AS OF JUNE 30, 1970

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. 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, 1969 and June 30, 1970 are shown for comparative purposes. Figures are rounded where necessary for simplicity of presentation.

	<u>June 30, 1969</u>	<u>June 30, 1970</u>
(1) <u>Membership</u>		
Active Members	612	651
Deferred Annuitants	16	15
Retired Members	113	116
Disabled Members	0	1
Widows of Deceased Members	49	51
Children of Deceased Members	32	36
(2) <u>Payroll and Annuities Payable</u>	(Thousands of Dollars)	
Total Payroll	\$ 5,261	\$ 6,551
Annuities (annual)	364	389
(3) <u>Valuation Balance Sheet</u>	(Thousands of Dollars)	
Accrued Liability	\$ 17,908	\$ 21,120
Assets	<u>7,503</u>	<u>9,099</u>
Unfunded Accrued Liability		
(Deficit)	\$ 10,405	\$ 12,021
Funding Ratio		
(Assets/ Accrued Liability)	41.9%	43.1%

(4) Normal Cost and Funding Costs

	<u>June 30, 1969</u>	<u>June 30, 1970</u>
	<u>% of Payroll</u>	<u>% of Payroll</u>
Normal Cost	14.35%	13.69%
Administrative Expense	<u>0.21</u>	<u>.09</u>
Normal Cost plus Expense	14.56%	13.78%
Normal Cost plus Expense	14.56%	13.78%
Interest on Deficit	<u>6.77</u>	<u>6.42</u>
Total (Minimum Contribution)	21.33%	20.20%
Normal Cost plus Expense	14.56%	13.78%
Amortization by 1997	<u>10.58</u>	<u>10.26</u>
Total (Required Contribution)	25.14%	24.04%

(5) Statutory Contributions

Employee	7.0%	7.0%
Employer Regular	11.2	11.2
Employer Additional	<u>8.0</u>	<u>8.0</u>
Total Contributions	26.2%	26.2%

2. Discussion of Valuation Results

The figures given above for 1969 and 1970 are not strictly comparable. Two separate valuations were carried out in 1969 and the results combined using average ages weighted by numbers of participants. As of July 1, 1969, the assets of the two funds were merged. The 1970 cost figures were calculated separately for the two groups because the average ages at retirement differ, and then the two sets of cost figures were combined.

With the new type of benefit formula which became effective in 1969, 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. In 1969, we assumed the salary of a participant would increase 3% each year; this assumption was changed to 3 1/2% in 1970.

The unfunded accrued liability increased from \$10,405,400 to \$12,020,949, an increase of \$1,615,549. An approximate breakdown of this increase follows:

Increases:

From Salary Scale Loss and Change in Assumption	\$ 1,631,265
From Corrections in Data on Post-Retirement Widow's Benefit	<u>622,386</u>
Total Increase	\$ 2,253,651

Decreases:

From Amortization Contribution	\$ 560,724
From Excess Interest and Capital Gains	<u>77,378</u>
Total Decreases	<u>638,102</u>
Net Increase	\$ 1,615,549

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, 1970.

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