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Public Employees Retirement Assn.

Public Employees' Retirement Association
State of Minnesota

ACTUARIAL VALUATION REPORT

November 22, 1965

ARTHUR STEDRY HANSEN CONSULTING ACTUARIES

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ARTHUR STEDRY HANSEN CONSULTING ACTUARIES

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November 22, 1965

Board of Trustees
Public Employees Retirement
Association of Minnesota
Centennial Office Building
St. Paul, Minnesota

Gentlemen:

In accordance with your request, we have made an actuarial valuation of the Public Employees Retirement Association of the State of Minnesota for the year ended June 30, 1965, in order to determine the adequacy of the contributions being made to that system and to prepare the financial and actuarial reports as required by the laws of the State of Minnesota.

The results of our analysis are set forth in the following report. The basic financial and employee data are those submitted to us by the Association office; the summaries and actuarial figures are those prepared by us from such data.

On the basis of the foregoing, and the assumptions indicated herein, we hereby certify that, to the best of our knowledge and belief, the attached statements are true and correct. A copy of this report will supply the data required by the legislative commission for the year ended June 30, 1965.

Respectfully submitted,
ARTHUR STEDRY HANSEN
CONSULTING ACTUARIES

Davis H. Roensch
Davis H. Roensch
Fellow, Society of Actuaries

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Public Employees Retirement Association
State of Minnesota

Actuarial Valuation Report and Financial Exhibits

General Fund

The following exhibits set forth the information required by law for the legislature as a result of the actuarial valuation. They are accompanied by financial exhibits which combine the audited financial reports of the system with the results of the actuarial valuation.

These figures have been prepared in accordance with the requirements of the law under the supervision of an approved actuary. Chief among these requirements are the use of the entry age normal cost method and 3% interest, both of which are reflected in the first series of exhibits. The other assumptions as to mortality, disability, withdrawal, and salary scales which were used in the valuation are set forth in Appendix 1 of this section.

The actuarial valuation presented in this report measures all aspects of the General Fund in accordance with the benefit program as it will be in force during the coming fiscal year, July 1, 1965 - June 30, 1966, with one exception. Because of the complexity and indeterminate nature of the calculation, no allowance has been made for the possible additional obligation which would arise from the provision which permits a member of the system to purchase additional pension credits by making back contributions for prior public employment. The remaining provision of the law as summarized in the plan summary in Appendix 2, have been taken into account in computing the actuarial obligation under the system.

It is the conclusion of this report that, on the basis of 3% interest and the entry age normal cost calculation, the contributions to the Public Employees Retirement Association fall short by 0.37% of the rate which would be necessary to provide for the value of benefits being earned by service during the current year and the amount required to amortize the unfunded obligation by 1997. (See Exhibit 2.) Despite this, we believe that the system is in reasonable actuarial

balance because of the substantial expectancy that the investment return earned on the assets in the fund will exceed 3%.

For example, corresponding Exhibits 1a and 2a in the report illustrate that the fund as a whole is in actuarial balance, should 3-1/2% rather than 3% be the long range rate of return. Furthermore, as shown in Exhibit 5, analysis of the financial statistics of the General Fund for the past year indicates that it had had an experience gain over the past year, chiefly due to interest earnings in excess of 3%. For these reasons, we would make no recommendation for a change in contribution rates to the present program at this time.

The required information on the employees covered by the General Fund is set out in Appendix 3.

Conclusion

It is our conclusion that the General Fund is in reasonable actuarial balance and that the benefits earned during the year 1965-1966 could be provided by the combined employer-employee 14-1/2% contribution rate. To remain actuarially sound and to meet the statutory requirement of full funding by 1997. However, the Employers must continue to not only match the current employee contribution but also levy an additional 2-1/2% to finance the benefits earned prior to 1957.

Public Employees Retirement Association
State of Minnesota

FINANCIAL BALANCE SHEET
(Year Commencing July 1, 1965)

(General Fund)

ASSETS

Cash - On Hand	\$	25.00		
On Deposit		<u>521,047.93</u>	\$	521,072.93
Accounts Receivable				
From Police and Fire Fund	\$	14,634.97		
Member Contributions		538,635.79		
Sections 353.11 and .36		24,216.48		
Employer Contributions		19,704,533.80		
Interest		992,186.96		
Dividends		8,342.92		
Other		<u>1,016.29</u>	\$	<u>21,283,567.21</u>
			\$	21,804,640.14
Less Current Liabilities				87,590.18
Net Current Assets				21,717,049.96

INVESTMENTS

Bonds				
U. S. Government	\$	6,655,000.00		
Municipal		20,289,000.00		
Corporate		56,440,614.47		
Stocks				
Common		<u>\$21,115,187.21</u>	\$	104,499,801.68
Miscellaneous				
Office Equipment (less depn.)	\$	22,406.74		
Other		<u>7,115.88</u>	\$	<u>29,522.62</u>
			\$	<u>104,529,324.30</u>
Total Assets				<u>\$126,246,374.26</u>

Members accumulated contributions \$56,030,991.20

Public Employees Retirement Association
State of Minnesota

FINANCIAL BALANCE SHEET
(Year Commencing July 1, 1965)

(General Fund)

LIABILITIES

Accounts Payable	\$	7,332.96			
Retirement					
Survivor					
Refunds		11,255.02			
Expenses					
Suspense Items		69,002.20	\$	87,590.18	
Less Offset Against Current Assets				87,590.18	0

RESERVES

Entry Age Normal Reserves at 3% — Active Members					
Retirement		\$241,748,813.00			
Disability		12,931,115.00			
Survivors		21,829,899.00			
Refund		19,409,850.00			
		\$295,919,677.00			
Less Value of Benefits to be Earned in the Future		\$108,354,509.00	\$	187,565,168.00	
Vested Members			\$	3,135,077.00	
Retired Members					
Retirement		\$ 60,284,586.00			
Disability		1,199,832.00			
Survivors		21,890,235.00	\$	83,374,653.00	\$274,074,898.00
Unfunded Obligation					147,828,523.74
Funded Obligation					\$126,246,374.26

Public Employees Retirement Association
State of Minnesota

ACTUARIAL REQUIREMENTS
(July 1, 1965)

June 30, 1965 Census and Valuation -- 3% Interest

(General Fund)

AMORTIZATION RATE REQUIREMENT

Present Value of Benefits (For Both Past and Future Service)		\$382,429,407
Obligation For Service		
Rendered to Date	\$ 274,074,898	
Net Assets	126,246,374	
Accrued Unfunded Obligation	147,828,524	
 Funding Ratio		 46%
Amortization (32 Year) Requirement	7,250,546	
Covered Payroll	154,895,063	
Amortization (32 Year) Rate Requirement		<u>4.68%</u>

ENTRY AGE NORMAL RATE REQUIREMENT

Value of Benefits to be		
Earned in the Future	108,354,509	
Present Value of Future Payroll	1,071,789,500	
 Normal Cost Rate Requirement	 10.11%	
Employee Contribution Rate	6.00*	
Employer Normal Cost Rate Requirement		<u>4.19%</u>

ACTUARIAL BALANCE

Employer Contribution Rate Set by Law		8.50%*
Amortization (32 Year) Rate Requirement	4.68%	
Normal Cost Rate Requirement	4.19	
Total Entry Age Normal Rate Requirement		8.87
Excess (Deficit) of Employer Contribution Rate Set by Law and Total Entry Age Normal Requirement		<u>(0.37%)</u>

*Smaller Hospital rate would have an insignificant effect.

Public Employees Retirement AssociationState of Minnesota(General Fund)SOURCES AND USES OF FUNDS

<u>Sources</u>		<u>Uses</u>	
<u>Employee Contributions</u>	\$ 8,314,267.92	<u>Refunds (net)</u>	\$ 3,211,136.74
		<u>Penalties</u>	3,580.04
<u>Employer Contributions</u>		<u>Benefits Paid</u>	
Regular	11,369,344.80	Retirement	6,026,938.66
Advance	268,416.57	Survivor	1,542,037.20
Refunds	(1,558.40)	Disability	186,415.36
<u>Investment Income</u>	3,978,196.00	<u>Cancelled Warrants</u>	(46,514.24)
Refunds	(10,237.53)	<u>Direct Expense</u>	341,132.13
<u>Transfer from the General Fund</u>	(39,284.12)	<u>Social Security</u>	68,125.45
<u>Miscellaneous Income</u>	2,797.84		
<u>Investment Sales</u>		<u>Investment Purchases</u>	
Bonds	25,223,034.28	Bonds	30,063,756.22
Stocks	180,434.98	Stocks	8,008,236.23
Notes	2,291.42	Premium and Interest	28,669.11
Premium and Gain	<u>17,889.67</u>		
Total	\$49,305,593.43		\$49,433,512.90
Decrease in Cash Account	118,271.58		-
Decrease in Accounts Receivable	<u>9,647.89</u>		-
	<u>\$49,433,512.90</u>		<u>\$49,433,512.90</u>

Public Employees Retirement AssociationState of Minnesota(General Fund)RECONCILIATION OF ASSET BALANCES

Asset Balance - July 1, 1964		\$113,645,754.32
Add:		
Employer Contributions	\$11,761,059.91	
Employee Contributions	8,304,751.40	
Investment Income	3,996,180.90	
Transfer to the General Fund	(39,284.12)	
Miscellaneous Income	2,797.84	
Total Additions		<u>24,025,505.93</u>
		\$137,671,260.25
Deduct:		
Benefits Paid		
Retirement	\$6,026,938.66	
Survivor	1,542,037.20	
Disability	186,415.36	
Cancelled Warrants	(46,514.24)	\$ 7,708,876.98
Refunds	3,217,345.61	
Return of Refunds	(2,628.83)	3,214,716.78
Social Security		68,125.45
Expense		345,576.60
Total Deductions		<u>11,337,295.81</u>
Asset Balance - June 30, 1965		<u><u>\$126,333,964.44</u></u>

Public Employees Retirement AssociationState of Minnesota(General Fund)STATEMENT OF REVENUE, EXPENDITURES,
CHANGES IN RESERVES AND EXPERIENCE GAIN (LOSS)

(Year Ending June 30, 1965)

Revenue:

Employee Contributions		\$ 8,304,751.40	
Employer Contributions	\$11,492,643.34		
Advance Contributions	<u>268,416.57</u>	11,761,059.91	
Investment Income		3,985,340.39	
Gain on Sale of Securities		10,840.51	
Other		<u>2,797.84</u>	
Total Revenue			\$24,064,790.05

Expenditure:

Benefits		\$ 7,708,876.98	
Refund of Contributions		3,214,716.78	
Social Security		68,125.45	
Administrative Expense		<u>345,576.60</u>	
Total Expenditures			<u>11,337,295.81</u>
Increase in Assets (1964)			\$12,727,494.24
Estimated Increase in Actuarial Reserves			<u>11,347,736.29</u>
Decrease (Increase) in Unfunded Obligation			<u><u>\$ 1,379,757.95</u></u>

Public Employees Retirement Association
State of Minnesota

FINANCIAL BALANCE SHEET
(Year Commencing July 1, 1965)

(General Fund)

ASSETS

Cash - On Hand	\$	25.00		
On Deposit		<u>521,047.93</u>	\$	521,072.93
Accounts Receivable				
From Police and Fire Fund	\$	14,634.97		
Member Contributions		538,635.79		
Sections 353.11 and .36		24,216.48		
Employer Contributions		19,704,533.80		
Interest		992,186.96		
Dividends		8,342.92		
Other		<u>1,016.29</u>	\$	<u>21,283,567.21</u>
			\$	21,804,640.14
Less Current Liabilities				87,590.18
Net Current Assets				21,717,049.96

INVESTMENTS

Bonds				
U. S. Government	\$	6,655,000.00		
Municipal		20,289,000.00		
Corporate		56,440,614.47		
Stocks				
Common		<u>\$21,115,187.21</u>	\$	104,499,801.68
Miscellaneous				
Office Equipment (less depn.)	\$	22,406.74		
Other		<u>7,115.88</u>	\$	<u>29,522.62</u>
			\$	<u>104,529,324.30</u>
Total Assets				<u>\$126,246,374.26</u>

Members accumulated contributions \$56,030,991.20

Public Employees Retirement Association
State of Minnesota

FINANCIAL BALANCE SHEET
(Year Commencing July 1, 1965)

(General Fund)

LIABILITIES

Accounts Payable	\$	7,332.96		
Retirement				
Survivor				
Refunds		11,255.03		
Expenses				
Suspense Items		<u>69,002.20</u>	\$	87,590.18
Less Offset Against Current Assets				<u>87,590.18</u>
				0

RESERVES

Entry Age Normal Reserves at 3-1/2% — Active Members				
Retirement	\$	215,156,445.00		
Disability		11,508,692.00		
Survivors		19,428,610.00		
Refund		<u>17,274,766.00</u>		
		\$263,368,513.00		
Less Value of Benefits to be Earned in the Future	\$	<u>91,534,776.00</u>	\$	171,833,737.00
Vested Members			\$	3,060,193.00
Retired Members				
Retirement	\$	58,476,048.00		
Disability		1,163,837.00		
Survivors		<u>21,233,528.00</u>	\$	<u>80,873,413.00</u>
				\$255,767,343.00
Unfunded Obligation				129,520,968.74
Funded Obligation				<u>\$126,246,374.26</u>

Public Employees Retirement Association
State of Minnesota

ACTUARIAL REQUIREMENTS
(July 1, 1965)

June 30, 1965 Census and Valuation — 3-1/2% Interest

(General Fund)

AMORTIZATION RATE REQUIREMENT

Present Value of Benefits (For Both Past and Future Service)		\$347,302,119
Obligation For Service		
Rendered to Date	\$ 255,767,343	
Net Assets	126,246,374	
Accrued Unfunded Obligation	129,520,969	
Funding Ratio		49%
Amortization (32 Year) Requirement	6,792,339	
Covered Payroll	154,895,063	
Amortization (32 Year) Rate Requirement		<u>4.39%</u>

ENTRY AGE NORMAL RATE REQUIREMENT

Value of Benefits to be		
Earned in the Future	91,534,776	
Present Value of Future Payroll	1,028,917,900	
Normal Cost Rate Requirement	8.90%	
Employee Contribution Rate	6.00*	
Employer Normal Cost Rate Requirement		<u>2.90%</u>

ACTUARIAL BALANCE

Employer Contribution Rate Set by Law		8.50%*
Amortization (32 Year) Rate Requirement	4.39%	
Normal Cost Rate Requirement	2.90	
Total Entry Age Normal Rate Requirement		7.29
Excess (Deficit) of Employer Contribution Rate Set by Law and Total Entry Age Normal Requirement		<u>1.21%</u>

*Smaller Hospital rate would have an insignificant effect.

General FundACTUARIAL ASSUMPTIONS

While ample statistics were available, it did not appear desirable to process these for an experience analysis since an Actuarial Survey will be required by law in 1967. Consequently, the following experience factors based on public retirement systems closely resembling the Public Employees Retirement Association were adopted for purposes of making this valuation.

Interest:	3.0%
Mortality Before Retirement:	1951 Group Annuity
After Retirement:	1965 Group Annuity
Retirement Age:	65
Disability:	Illinois Municipal Experience
Turnover:	PERA Experience
Salary Scale:	Experience Rates
1952-57 Wage Base:	Estimate based on 1952-57 contributions

Age 65 was used as the average age at retirement since it both reflected the retirement rates developed in earlier studies, and the prior calculations of the legislative commission.

A detailed statement of the mortality rates, disability rates, turnover factors and salary scale is set out in the following pages.

Public Employees' Retirement Association
State of Minnesota

General Fund

Male Employees

MORTALITY RATES

(Per 1,000 Employees)

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	.616	45	3.580
21	.640	46	4.065
22	.666	47	4.599
23	.693	48	5.180
24	.724	49	5.807
25	.758	50	6.475
26	.796	51	7.187
27	.838	52	7.938
28	.885	53	8.731
29	.935	54	9.563
30	.991	55	10.436
31	1.054	56	11.346
32	1.122	57	12.298
33	1.198	58	13.302
34	1.281	59	14.379
35	1.374	60	15.555
36	1.475	61	16.866
37	1.587	62	18.353
38	1.711	63	20.068
39	1.849	64	22.067
40	2.000	65	24.418
41	2.192		
42	2.450		
43	2.769		
44	3.147		

Public Employees' Retirement Association
State of Minnesota

General Fund
Female Employees
MORTALITY RATES
(Per 1,000 Employees)

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	.371	45	1.994
21	.393	46	2.169
22	.416	47	2.361
23	.440	48	2.573
24	.467	49	2.809
25	.495	50	3.070
26	.524	51	3.319
27	.556	52	3.597
28	.591	53	3.908
29	.628	54	4.257
30	.669	55	4.648
31	.712	56	5.102
32	.760	57	5.637
33	.812	58	6.265
34	.868	59	6.997
35	.930	60	7.837
36	.997	61	8.788
37	1.071	62	9.848
38	1.152	63	11.010
39	1.240	64	12.264
40	1.338	65	13.597
41	1.446		
42	1.563		
43	1.694		
44	1.836		

Public Employees' Retirement Association
State of Minnesota

General Fund

All Employees

DISABILITY RATES

(Per 1,000 Employees)

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	.69	45	3.17
21	.73	46	3.41
22	.77	47	3.67
23	.81	48	3.94
24	.86	49	4.25
25	.91	50	4.61
26	.96	51	5.01
27	1.02	52	5.48
28	1.08	53	6.00
29	1.15	54	6.53
30	1.22	55	7.12
31	1.29	56	7.76
32	1.37	57	8.45
33	1.45	58	9.17
34	1.54	59	9.91
35	1.63	60	10.69
36	1.73	61	11.53
37	1.84	62	12.38
38	1.96	63	13.25
39	2.09	64	14.15
40	2.23		
41	2.38		
42	2.55		
43	2.74		
44	2.94		

Public Employees' Retirement Association
State of Minnesota

General Fund
Male Employees
SEPARATION RATES
(Per 1,000 Employees)

<u>Age</u>	<u>Separation</u>	<u>Age</u>	<u>Separation</u>
20	275.0	40	81.8
21	263.8	41	76.2
22	250.5	42	71.5
23	239.0	43	67.0
24	226.5	44	62.2
25	216.0	45	58.0
26	204.5	46	53.9
27	192.5	47	49.7
28	182.0	48	45.0
29	171.5	49	42.0
30	161.0	50	38.5
31	152.8	51	34.5
32	143.5	52	31.0
33	133.0	53	27.0
34	124.5	54	23.0
35	117.0	55	19.5
36	109.2	56	15.0
37	101.0	57	10.0
38	94.0	58	5.0
39	88.0		

Public Employees' Retirement Association
State of Minnesota

General Fund

Female Employees

SEPARATION RATES
(Per 1,000 Employees)

<u>Age</u>	<u>Separation</u>	<u>Age</u>	<u>Separation</u>
20	383.2	40	134.0
21	377.7	41	123.0
22	371.2	42	113.0
23	363.1	43	104.5
24	351.6	44	97.2
25	335.6	45	90.0
26	322.6	46	83.0
27	310.3	47	78.7
28	299.7	48	74.5
29	289.1	49	70.4
30	280.5	50	66.3
31	269.4	51	62.8
32	259.0	52	59.5
33	246.3	53	55.5
34	232.5	54	52.2
35	216.0	55	47.8
36	199.0	56	41.0
37	183.0	57	36.2
38	165.0	58	21.0
39	148.5	59	5.0

Public Employees' Retirement Association
State of Minnesota

General Fund

All Employees

EARNINGS PROGRESSION

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	.4102	45	.6730
21	.4184	46	.6864
22	.4268	47	.7002
23	.4353	48	.7142
24	.4440	49	.7284
25	.4529	50	.7430
26	.4619	51	.7579
27	.4712	52	.7730
28	.4806	53	.7885
29	.4902	54	.8043
30	.5000	55	.8203
31	.5100	56	.8368
32	.5202	57	.8535
33	.5306	58	.8706
34	.5412	59	.8880
35	.5521	60	.9057
36	.5631	61	.9238
37	.5744	62	.9423
38	.5859	63	.9612
39	.5976	64	.9804
40	.6095	65	1.0000
41	.6217		
42	.6342		
43	.6468		
44	.6598		

Public Employees Retirement Association
State of Minnesota

General Fund

SUMMARY OF PLAN

1. Name

Public Employees Retirement Association.

2. Type of Plan

Self-insured, managed by a 12 member Board of Trustees consisting of the State Auditor, State Insurance Commissioner, State Treasurer, and nine others elected from the membership of the Association.

3. Employers Included

Any county, city, village, borough, town, school district within the State, or a department or unit of the State or any other public body employing any person who is a public employee as defined by the Law.

4. Employees Included

All full-time employees, except those on a per diem basis, of an eligible employer who are not contributing to another plan.

5. Service Considered

All periods of service in which salary deductions were made or for which payments in lieu of salary deduction were deposited, including seasonal layoff and authorized sick leaves.

6. Earnings Considered

(a) For service prior to July 1, 1957, average of highest consecutive 5 years prior to such date, not to exceed \$4,800.

(b) For service during the period July 1, 1957 to July 1, 1965, all earnings not to exceed \$4,800 in any calendar year.

(c) After July 1, 1965, all earnings not to exceed \$6,000 in any calendar year.

(d) Earnings considered for determining benefit under the law in force prior to 1957 shall be the average annual earnings during the 10-year period immediately preceding retirement limited to a maximum of \$4,800.

7. Employer Contributions

Municipal — Amount equal to 6% of total considered earnings for current service plus 2-1/2% of total considered earnings to amortize past service cost.

Hospital — Amount equal to 3% of total considered earnings for current service plus 2% of total considered earnings through calendar year 1965 and 1-1/2% thereafter to amortize past service costs.

8. Employee Contributions

- (a) For service prior to July 1, 1957, 4% of considered earnings.
- (b) After July 1, 1957, 6% of considered earnings, except Hospital employees, 3% of considered earnings.

9. Normal Retirement Benefit

After attainment of age 65 and completion of 10 years of service.

Municipal — Annuity equal to the sum of:

- 1) (a) 1% of considered earnings for each of the first ten years plus;
(b) 2% of considered earnings for each of the second ten years plus;
(c) 2-1/2% of considered earnings for each of the third ten years plus;
(d) 3% of considered earnings for each year over thirty.
- plus 2) 10% per year of service prior to July 1, 1957 (maximum 100%) of the difference (if any) between an annuity computed under item 1 and an annuity computed entirely under the old law formula.
- plus 3) An increment for considered earnings after July 1, 1965 in excess of \$4,800 (if any).

Hospital — Annuity equal to the sum of:

- 1) (a) 5/8% of considered earnings for each of the first ten years plus;
(b) 7/8% of considered earnings for each of the second ten years plus;
(c) 1.66% of considered earnings for each of the third ten years plus;
(d) 1.75% of considered earnings for each year over thirty.

10. Late Retirement Benefit

Annual annuity determined as for Normal Retirement, considering Service and Earnings to actual retirement.

11. Early Retirement Benefit

After attainment of age 58 and completion of 20 years of service.

Annual annuity determined as for Normal Retirement considering Service and Earnings to actual retirement and reduced by 1/2 of 1% for each month between actual retirement and attainment of age 65.

12. Disability Benefit

In event of total and permanent disability after completion of 10 years of service or attainment of age 50 and completion of 5 years of service.

Annual Annuity determined as for Normal Retirement, considering Service and Earnings to date of disablement, plus a supplement equal to \$5 for each year which age at disablement is less than 65, maximum \$50.

13. Death Benefit — Not applicable to Hospital Employees

Active - In event of death after 18 months of service.

Annual Annuity to dependent spouse of 30% of average salary not to exceed \$65 per month, plus for each dependent child under age 18, 20% of average salary not to exceed \$45 per month, plus 10% of average salary not to exceed \$20 per month to be divided among dependent children. Maximum family benefit equal to lesser of \$250 per month or 100% of average salary.

In lieu of above benefit, if employee has attained age 58 and completed 20 years of service, a 75% survivor benefit for spouse payable at age 62. Maximum benefit \$150 per month.

Any employee (including Hospital employees) not eligible for above benefits, his contributions with interest at 2% shall be paid to his beneficiary.

Retired

(a) Under law in force July 1, 1957 and prior, 50% of his annuity continued to his beneficiary provided his beneficiary is his surviving spouse and has attained age 60, and has not remarried; or is the parent of the retired member.

(b) Under law in effect July 1, 1957 and subsequent, refund of contributions less benefit paid to date of death.

14. Separation Benefit

In event of termination after 10 years of service, a deferred vested benefit payable at age 65, provided participant does not withdraw contribution.

Annual Annuity determined as for Normal Retirement considering Service and Earnings to date of termination. In lieu of annuity, participant shall receive a refund of contributions without interest.

15. Optional Benefits

A participant may elect to receive an equivalent actuarially reduced annuity in the form of a joint and survivor annuity or a period certain and life thereafter annuity.

16. Expenses

Paid by Association from retirement fund.

17. Actuarial Method

For purpose of reports to the Legislative Commission, costs for the Plan shall be determined on an "entry-age level normal cost" basis amortizing the unfunded accrued liability over 40 years from 1957, 3% interest.

MEMBER DATA, COMMENTS AND STATISTICS

The Association's administrative office made data available on the employees covered by the program in the exact form requested by the actuary, and in sufficient time to prepare this report. Analysis of the data revealed that it was complete and adequate for valuation purposes though, because of the limitations of time to carry out the actuary's request, a sampling technique had to be used for the valuation of the benefits payable under the old law.

Heretofore, benefits for service prior to 1957 had been based on an estimated earnings base between 1952 and 1957. This estimate was formed by selecting a sample, estimating an earnings progression between the 1957 and current earnings of the employee, and using this relationship to estimate the 1952-57 earnings base from the current wage record of all employees.

It appeared more appropriate to establish the average earnings during this period by relating them to the contributions actually on those earnings during these years and adjusting for special non-recurring back contributions. In accordance with the actuary's recommendation, the Association office established the average earnings for the period 1952-57 based on the employee contributions during that period for employees who had service prior to 1957. The general characteristics of this sample was then compared to the larger groups and reflected the larger group very closely.

The actuarial valuation was then based on this more accurate estimate of earnings for the sample and the results were scaled upward in proportion to the number of employees which had this service. While this procedure provided a very accurate estimate of the obligation for benefits based on these earnings, the Association office is proceeding to establish these balances for all such employees so that future valuation reports will not need to depend on the sampling approach.

The law was changed for the year beginning July 1, 1965 to grant benefits based on earnings up to \$6,000 rather than \$4,800 under the earlier law. Since covered earnings did not extend above the \$4,800 limit in prior years, the Association office did not have a record of earnings in excess of \$4,800 on each

individual employee. They had made studies, however, of the total earnings of various employees' groups and this information provided a basis for a relatively accurate estimate of the earnings between \$4,800 and \$6,000.

For example, the Association figures indicated that, out of some \$75,508,000 of earnings for a group with over 10,000 employees earning in excess of \$4,800, some \$51,571,000 of those wages were covered earnings (i.e., under \$4,800) and \$23,936,000 were in excess of \$4,800. Combining the average age of the covered employees, with their average compensation over \$4,800, estimates of earnings levels by age were established based on the salary scale. This permitted the actuary to enter an estimate of the assumed earnings for each employee and value not only the benefits on a \$6,000 wage base but also to estimate the cost of the program if there were no earnings limit.

These estimated earnings, in the aggregate, were astonishingly accurate. For example, the total estimated compensation of the group came to \$76,422,000 as against the actual earnings of \$75,508,000, a variation of approximately 1% in a conservative direction.

The distribution of the active employees by type of employee, sex and wage level is set out in the following Exhibits. The characteristics of the various groups compares reasonably with prior studies, except the group has not expanded appreciably and is approximately two years older than its 1963 counterpart.

Public Employees Retirement Association
State of Minnesota

General Fund — Municipal Employees

CONSIDERED EARNINGS

Active Male Employees
(Age and Service as of July 1, 1965)

AGE	YEARS OF SERVICE							
	UNDER 1		1		2 - 4		5 - 9	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	437	1,100,879	217	761,830	176	663,639	10	41,122
25-29	376	991,803	316	1,172,131	593	2,176,206	298	1,034,977
30-34	291	798,259	252	1,009,445	684	2,942,993	670	3,116,176
35-39	301	803,625	252	1,033,068	608	2,652,421	791	3,805,244
40-44	290	789,259	278	1,186,273	707	3,276,300	907	4,461,384
45-49	290	781,119	229	965,631	635	3,005,914	930	4,765,726
50-54	238	628,440	218	913,491	632	2,991,591	1024	5,516,905
55-59	183	464,137	156	642,072	478	2,201,201	823	4,469,370
60-64	116	285,540	90	352,785	276	1,140,220	582	3,096,649
65-69	52	128,974	22	63,608	109	413,066	234	1,196,351
70&UP	34	81,600	23	58,286	67	241,226	155	602,404
	2608	6,853,645	2053	8,158,620	4965	21,704,777	6424	32,106,308

AGE	YEARS OF SERVICE							
	10 - 14		15 - 19		20 - 24		25 - 29	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	-	-
25-29	11	27,973	1	3,605	-	-	-	-
30-34	156	747,370	1	4,669	-	-	-	-
35-39	477	2,439,922	97	507,429	-	-	-	-
40-44	615	3,259,468	273	1,560,114	7	40,688	-	-
45-49	672	3,736,532	317	1,880,810	38	213,416	10	67,715
50-54	743	4,310,450	345	2,176,897	104	694,328	45	279,067
55-59	782	4,807,733	353	2,367,401	136	961,278	86	577,097
60-64	578	3,540,293	324	2,340,009	159	1,168,600	88	646,727
65-69	292	1,644,052	144	974,169	124	944,505	59	420,053
70&UP	93	465,888	45	325,216	42	275,386	40	289,187
	4419	24,979,681	1900	12,140,319	610	4,298,201	328	2,279,846

AGE	YEARS OF SERVICE				ALL	
	30 - 34		35 - 39			40 & OVER
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	840	2,567,470
25-29	-	-	-	-	1595	5,406,695
30-34	-	-	-	-	2054	8,618,912
35-39	-	-	-	-	2526	11,241,709
40-44	-	-	-	-	3077	14,573,496
45-49	1	4,626	-	-	3122	15,421,489
50-54	10	57,481	-	-	3359	17,568,650
55-59	38	252,675	4	29,990	3039	16,772,954
60-64	55	404,745	3	22,955	2274	13,027,126
65-69	46	330,270	8	57,020	1092	6,191,516
70&UP	26	170,660	2	12,312	532	2,556,587
	176	1,220,457	17	122,277	10	82,473
					23510113	946,604

Average Age 47.16

Average Service 7.99

Average Entry Age 39.17

Public Employees Retirement Association
State of Minnesota

General Fund — Municipal Employees

CONSIDERED EARNINGS

Active Female Employees
(Age and Service as of July 1, 1965)

AGE	YEARS OF SERVICE							
	UNDER 1		1		2 - 4		5 - 9	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	800	1,513,753	553	1,694,392	515	1,639,341	44	146,989
25-29	259	479,716	220	702,704	327	1,095,282	145	634,630
30-34	264	475,824	184	456,111	291	875,822	141	511,658
35-39	371	662,882	311	800,124	453	1,209,310	251	858,805
40-44	417	739,583	337	833,399	687	1,841,833	496	1,703,597
45-49	362	629,358	323	816,018	723	1,966,467	685	2,194,409
50-54	258	448,435	246	602,763	603	1,647,904	787	2,635,493
55-59	160	292,460	155	351,713	432	1,107,215	664	2,022,210
60-64	70	119,819	63	144,898	201	468,233	407	1,169,469
65-69	23	37,200	20	44,138	74	165,226	139	331,452
70&UP	11	18,810	5	8,036	18	34,286	53	131,393
	2995	5,417,840	2417	6,454,296	4324	12,050,919	3862	12,340,105

AGE	YEARS OF SERVICE							
	10 - 14		15 - 19		20 - 24		25 - 29	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	-	-
25-29	12	43,731	-	-	-	-	-	-
30-34	61	242,036	9	40,299	-	-	-	-
35-39	81	342,263	39	195,597	4	17,122	-	-
40-44	132	591,627	46	235,775	16	85,446	-	-
45-49	220	919,000	57	310,743	37	198,148	19	112,025
50-54	373	1,505,544	105	582,193	40	243,693	28	181,428
55-59	371	1,607,503	140	795,578	75	483,245	30	192,525
60-64	299	1,114,546	120	685,619	79	490,528	30	207,381
65-69	138	486,059	62	309,573	45	306,353	19	136,296
70&UP	56	157,468	12	51,135	9	41,812	16	115,715
	1743	7,009,777	590	3,206,512	305	1,866,347	142	945,370

AGE	YEARS OF SERVICE						
	30 - 34		35 - 39		40 & OVER		ALL
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO. EARNINGS
TO 25	-	-	-	-	-	-	1912 4,994,475
25-29	-	-	-	-	-	-	1013 2,956,063
30-34	-	-	-	-	-	-	950 2,601,750
35-39	-	-	-	-	-	-	1510 4,086,103
40-44	-	-	-	-	-	-	2131 6,031,260
45-49	-	-	-	-	-	-	2426 7,146,168
50-54	11	70,583	3	20,040	-	-	2454 7,938,076
55-59	22	148,820	6	35,304	-	-	2055 7,036,973
60-64	22	158,690	5	30,842	1	9,346	1297 4,599,371
65-69	16	108,426	2	19,066	1	4,200	539 1,947,989
70&UP	6	35,314	-	-	-	-	186 593,969
	77	521,833	16	105,252	2	13,546	16473 49,931,797

Average Age 45.05

Average Service 5.78

Average Entry Age 39.27

Public Employees Retirement Association
State of Minnesota

General Fund — Hospital Employees

CONSIDERED EARNINGS

Active Male Employees
(Age and Service as of July 1, 1965)

AGE	YEARS OF SERVICE							
	UNDER 1		1		2 - 4		5 - 9	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	86	208,034	14	38,049	-	-	-	-
25-29	32	80,673	19	55,810	-	-	-	-
30-34	21	58,688	12	36,370	-	-	-	-
35-39	18	51,087	15	54,504	1	4,267	-	-
40-44	14	37,227	12	40,137	3	16,143	-	-
45-49	15	38,785	7	24,499	2	8,990	-	-
50-54	12	29,096	9	40,558	3	16,826	-	-
55-59	16	40,850	4	25,607	2	12,368	-	-
60-64	5	12,924	5	15,559	3	17,125	-	-
65-69	2	4,800	3	9,388	1	4,654	-	-
70&UP	3	8,625	2	4,800	-	-	-	-
	224	570,789	102	345,281	15	80,373		

AGE	YEARS OF SERVICE							
	10 - 14		15 - 19		20 - 24		25 - 29	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-
60-64	-	-	-	-	-	-	-	-
65-69	-	-	-	-	-	-	-	-
70&UP	-	-	-	-	-	-	-	-

AGE	YEARS OF SERVICE							
	30 - 34		35 - 39		40 & OVER		ALL	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	100	246,083
25-29	-	-	-	-	-	-	51	136,483
30-34	-	-	-	-	-	-	33	95,058
35-39	-	-	-	-	-	-	34	109,858
40-44	-	-	-	-	-	-	29	93,507
45-49	-	-	-	-	-	-	24	72,274
50-54	-	-	-	-	-	-	24	86,480
55-59	-	-	-	-	-	-	22	78,825
60-64	-	-	-	-	-	-	13	45,608
65-69	-	-	-	-	-	-	6	18,842
70&UP	-	-	-	-	-	-	5	13,425
							341	996,443

Average Age 36.59

Average Service .93

Average Entry Age 35.66

Public Employees Retirement Association
State of Minnesota

General Fund — Hospital Employees

CONSIDERED EARNINGS

Active Female Employees

(Age and Service as of July 1, 1965)

AGE	YEARS OF SERVICE							
	UNDER 1		1		2 - 4		5 - 9	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	500	874,435	93	234,655	1	4,066	-	-
25-29	197	348,006	40	96,412	2	9,173	-	-
30-34	116	202,618	29	73,208	3	11,886	-	-
35-39	84	142,743	32	85,036	1	5,811	-	-
40-44	89	157,891	20	50,305	2	11,211	-	-
45-49	75	126,612	26	75,475	3	18,102	-	-
50-54	74	128,709	37	125,884	2	9,026	-	-
55-59	50	84,537	32	123,542	5	21,331	-	-
60-64	30	49,164	24	73,385	5	27,255	-	-
65-69	4	6,400	7	17,057	1	4,411	-	-
70&UP	4	6,400	-	-	-	-	-	-
	1223	2,127,515	340	954,959	25	122,272		

AGE	YEARS OF SERVICE							
	10 - 14		15 - 19		20 - 24		25 - 29	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-
60-64	-	-	-	-	-	-	-	-
65-69	-	-	-	-	-	-	-	-
70&UP	-	-	-	-	-	-	-	-

AGE	YEARS OF SERVICE						ALL	
	30 - 34		35 - 39		40 & OVER		NO.	EARNINGS
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS		
TO 25	-	-	-	-	-	-	594	1,113,156
25-29	-	-	-	-	-	-	239	453,591
30-34	-	-	-	-	-	-	148	287,712
35-39	-	-	-	-	-	-	117	233,590
40-44	-	-	-	-	-	-	111	219,407
45-49	-	-	-	-	-	-	104	220,189
50-54	-	-	-	-	-	-	113	263,619
55-59	-	-	-	-	-	-	87	229,410
60-64	-	-	-	-	-	-	59	149,804
65-69	-	-	-	-	-	-	12	27,868
70&UP	-	-	-	-	-	-	4	6,400
							1588	3,204,746

Average Age 34.33

Average Service .76

Average Entry Age 33.57

Public Employees Retirement Association
State of Minnesota

General Fund

Municipal Employees Only

Disability Retirements

Age	Male		Female	
	Number	Monthly Annuity	Number	Monthly Annuity
40	1	97.58		
43	1	80.45		
44	1	87.84		
46	1	86.51		
49	1	101.23	1	103.23
50	1	98.96		
51	3	290.82	1	91.48
52	1	102.53		
53	3	373.19		
54	4	496.15		
55	4	449.81		
56	8	875.88	3	284.24
57	2	161.90	5	569.18
58	4	517.25	1	92.90
59	7	624.82	5	554.66
60	5	451.50	1	59.84
61	5	559.34	1	41.30
62	4	520.31	3	303.49
63	3	201.90	3	263.47
64	7	591.21	4	313.95
65	9	585.58	5	376.60
66	6	371.01	2	112.40
67	2	67.52	3	93.74
68	2	64.58	1	31.84
69	1	36.69	2	136.17
70			1	82.49
Totals	<u>86</u>	<u>\$7,894.56</u>	<u>42</u>	<u>\$3,510.98</u>

Public Employees Retirement Association
State of Minnesota

General Fund

Municipal Employees Only

Retired Under Law in Force Prior to July 1, 1957

Age	Male		Female	
	Number	Monthly Annuity	Number	Monthly Annuity
60	2	210.92		
61	3	326.43	5	423.24
62	5	630.66	6	605.58
63	16	2,578.24	8	1,096.43
64	21	3,234.73	22	3,310.02
65	37	6,015.03	25	3,220.76
66	89	14,687.45	42	5,221.54
67	90	15,786.33	55	8,346.61
68	127	19,193.22	57	7,835.54
69	177	29,523.25	68	9,213.55
70	178	26,988.38	64	7,807.87
71	192	30,393.61	55	6,672.86
72	165	23,688.52	54	6,012.82
73	215	29,475.01	67	6,580.41
74	194	24,361.30	64	6,149.87
75	163	20,893.40	63	5,902.07
76	174	22,302.92	65	5,889.40
77	132	15,455.73	71	6,487.13
78	126	13,764.76	45	4,310.84
79	94	9,916.18	28	2,161.11
80	85	9,491.20	31	2,073.85
81	82	9,136.97	32	3,329.05
82	65	6,913.84	19	1,417.53
83	44	4,855.85	22	1,996.23
84	36	3,784.29	11	785.59
85	35	3,029.26	10	1,021.91
86	25	2,912.60	4	371.39
87	29	3,240.76	6	437.95
88	13	1,468.17	3	242.15
89	7	813.05	2	308.30
90	8	899.24	4	284.10
91	5	474.16	1	65.79
92	3	295.48	1	163.18
93	2	214.75	1	65.62
94	1	58.19	1	92.53
98	1	102.27		
Totals	<u>2641</u>	<u>\$357,116.24</u>	<u>1012</u>	<u>\$109,902.82</u>

Public Employees Retirement Association
State of Minnesota

General Fund

Municipal Employees Only

Retired Under Law in Force July 1, 1957 and Subsequent

Age	Male		Female	
	Number	Monthly Annuity	Number	Monthly Annuity
58			1	174.08
59				
60				
61	1	92.08		
62	1	179.10	1	57.17
63			3	200.36
64	3	253.89	3	407.28
65	14	1,022.34	8	473.32
66	32	1,442.16	24	1,200.46
67	47	2,616.31	21	987.66
68	49	2,253.45	27	1,815.70
69	58	3,356.08	25	1,377.47
70	42	2,866.47	31	1,771.73
71	52	3,136.05	21	1,548.00
72	35	2,534.05	23	1,364.45
73	18	1,287.97	13	1,371.09
74	6	412.45	7	960.12
75	5	153.29	4	278.14
76	1	136.80	5	846.74
77				
78	1	331.25		
79	1	25.32	2	401.74
80	2	220.74		
81	1	32.43	1	207.55
82			1	172.60
83				
84				
85			1	89.99
Totals	<u>369</u>	<u>\$22,352.23</u>	<u>222</u>	<u>\$15,705.65</u>

Public Employees Retirement Association
State of Minnesota

General Fund

Municipal Employees Only

Beneficiaries Under Law in Force Prior to July 1, 1957

Age	Male		Female	
	Number	Monthly Annuity	Number	Monthly Annuity
60			3	241.05
61			14	903.03
62			17	960.42
63			36	2,507.33
64			33	2,139.93
65			26	1,711.50
66			29	1,730.73
67			36	2,167.33
68			34	2,290.32
69			44	3,207.30
70			34	2,110.74
71			46	3,101.13
72	1	76.50	58	3,526.74
73			42	2,482.73
74			35	2,025.67
75			40	2,043.93
76			49	2,506.27
77	1	36.27	44	2,615.63
78	1	9.06	31	1,394.06
79			40	2,182.19
80	1	10.57	26	1,212.84
81			33	1,626.79
82	2	113.54	18	971.36
83			22	978.34
84	1	65.69	11	591.78
85			6	280.83
86			11	565.08
87			4	193.85
88	1	42.48	4	240.75
89			6	250.55
90			1	39.05
91			2	133.63
93			2	84.63
Totals	<u>8</u>	<u>\$354.11</u>	<u>837</u>	<u>\$49,017.51</u>

Public Employees' Retirement Association
State of Minnesota

General Fund

Municipal Employees Only

Survivor Annuities

FEMALE

<u>Age</u>	<u>Number</u>	<u>Monthly Annuity</u>	<u>Age</u>	<u>Number</u>	<u>Monthly Annuity</u>
23	1	65.00			
24					
25	1	49.47	55	27	1,732.62
26			56	25	1,591.43
27			57	24	1,504.87
28			58	34	2,193.34
29	1	65.00	59	32	2,032.02
30			60	30	1,921.67
31			61	34	2,158.08
32			62	34	2,197.04
33			63	28	1,800.38
34	2	130.00	64	24	1,747.80
35	1	65.00	65	30	2,256.29
36	1	65.00	66	21	1,571.86
37	1	65.00	67	23	1,556.63
38	1	65.00	68	16	1,308.97
39	2	130.00	69	20	1,566.51
40			70	19	1,683.34
41	2	130.00	71	15	1,163.97
42	3	157.47	72	10	823.18
43	4	260.00	73	12	916.23
44	2	130.00	74	17	1,268.73
45	4	260.00	75	10	766.98
46	4	260.00	76	11	820.54
47	4	234.42	77	8	654.56
48	14	909.59	78	7	444.96
49	5	325.00	79	2	108.14
50	15	932.50	80	1	23.97
51	19	1,219.15	81	6	526.09
52	26	1,590.08	82	3	195.00
53	19	1,199.12	83	1	65.00
54	19	1,211.09	84	1	7.42
			86	1	148.66
				<u>678</u>	<u>\$46,274.17</u>

Public Employees Retirement Association
State of Minnesota

General Fund

Municipal Employees Only

Survivor Annuities

<u>Male</u>			<u>Widows and Children</u>		
<u>Age</u>	<u>Number</u>	<u>Monthly Annuity</u>	<u>Widow's Age</u>	<u>Number</u>	<u>Total Monthly Annuity</u>
52	1	65.00	23		
54	1	65.00	24	1	220.00
57	1	65.00			
61	1	48.11	25		
62	1	65.00	26		
67	2	130.00	27	1	220.00
75	1	65.00	28	1	175.00
78	1	65.00	29		
			30	2	395.00
			31		
			32	1	250.00
			33	3	570.00
			34	3	570.00
			35	4	920.00
			36	8	1,530.00
			37	5	880.00
			38	12	2,472.70
			39	5	808.66
			40	7	1,035.00
			41	3	503.52
			42	13	1,964.84
			43	9	1,830.00
			44	11	1,835.00
			45	17	2,676.75
			46	14	2,300.00
			47	10	1,493.73
			48	10	1,481.80
			49	12	1,810.58
			50	10	1,336.15
			51	9	1,260.00
			52	10	1,510.00
			53	13	1,772.14
			54	6	870.00
			55	11	1,595.00
			56	10	1,344.97
			57	1	130.00
			58	4	565.00
			59		
			60	1	175.00
Totals	9	\$568.11		227	\$36,500.84

Public Employees Retirement Association
State of Minnesota

General Fund

Hospital Employees Only

Retired Under Law in Force July 1, 1957 and Subsequent

MALES

<u>Age</u>	<u>Number</u>	<u>Monthly Annuity</u>
63	1	\$130.01
68	1	203.16
<u>Total</u>	<u>2</u>	<u>\$333.17</u>

Public Employees Retirement Association
State of Minnesota

Actuarial Valuation Report and Financial Exhibits

Police and Fire Fund

The following exhibits set forth the information required by law for the legislature as a result of the actuarial valuation. They are accompanied by financial exhibits which combine the audited financial reports of the system with the results of the actuarial valuation.

These figures have been prepared in accordance with the requirements of the law under the supervision of an approved actuary. Chief among these requirements are the use of the entry age normal cost method and 3% interest, both of which are reflected in the first series of exhibits. The other assumptions as to mortality, disability, withdrawal, and salary scales which were used in the valuation are set forth in Appendix 1 of this section.

The actuarial valuation presented in this report measures all aspects of the fund in accordance with the benefit program as it will be in force during the coming fiscal year, July 1, 1965 - June 30, 1966. The provisions of the law as summarized in the plan summary in Appendix 2, have been taken into account in computing the actuarial obligation under the system.

It is the conclusion of this report that, on the basis of 3% interest and the entry age - normal cost calculation, the contributions to the Public Employees Police and Fire Fund fall short by 5.74% of the rate which would be necessary to provide for the value of benefits being earned by service during the current year and the amount required to amortize the unfunded obligation by 1997. (See Exhibit 2.)

Even if 3-1/2% rather than 3% be the long range rate of return, the current contribution rates still fall short of the required rate by 3.25%. (See Exhibits 1a and 2a.) The actuarial deficit is most clearly illustrated in Exhibit 5 where an estimate of the increase in actuarial obligation, as measured against

the legislature's objective of full funding by 1997, would be set at \$201,718.74. Based on these calculations we recommend that consideration be given to increasing the employer's contribution rate to the Police and Fire Fund by 3-1/2%.

The information required by law on the employees covered by the Police and Fire Fund is set out in Appendix 3.

CONCLUSION

It is our conclusion that the Police and Fire Fund is not in reasonable actuarial balance and that the benefits earned during the year 1965-66 could only be provided by a combined employer-employee contribution rate of 21%. If a 3% future interest expectancy is to be the basis of the required contribution rate, the combined rate necessary to fund the program in accordance with the legislature's objectives would be set at the 23% level. The principal reasons underlying the much higher contribution rates required for the Police and Fire Fund are the higher rate of benefit (2%) being earned in the first ten years of service, more generous benefits for those with service prior to 1957, and, most important, the right to retire with full benefits at age 58.

Public Employees Retirement Association
State of Minnesota

FINANCIAL BALANCE SHEET
(Year Commencing July 1, 1965)

(Police and Fire Fund)

ASSETS

Cash - On Hand	\$ -		
On Deposit	<u>36,256.43</u>	\$ 36,256.43	
Accounts Receivable			
Member Contributions	\$ 33,459.73		
Sections 353.36	131.71		
Employer Contributions	1,570,100.23		
Interest	39,951.45		
Dividends	<u>467.84</u>	<u>\$ 1,644,100.96</u>	\$ 1,680,367.39
Less Current Liabilities			14,641.53
Net Current Assets			1,665,725.86

INVESTMENTS

Bonds			
U. S. Government	\$ 1,459,751.89		
Municipal	-		
Corporate	3,103,887.85		
Stocks			
Common	<u>\$ 1,169,196.76</u>		<u>\$ 5,732,836.50</u>
Total Assets			<u>\$ 7,398,562.36</u>

Members accumulated contributions \$3,026,511.61

Public Employees Retirement Association
State of Minnesota

FINANCIAL BALANCE SHEET
(Year Commencing July 1, 1965)

(Police and Fire Fund)

LIABILITIES

Accounts Payable	\$ 14,641.53		
Retirement			
Survivor			
Refunds	0		
Expenses			
Suspense Items	0	\$ 14,641.53	
Less Offset Against Current Assets		<u>14,641.53</u>	0

RESERVES

Entry Age Normal Reserves at 3% - Active Members			
Retirement	\$ 21,749,500.00		
Disability	4,426,493.00		
Survivors	1,223,017.00		
Refund	<u>517,390.00</u>		
	\$ 27,916,400.00		
Less Value of Benefits to be Earned in the Future	<u>\$ 14,848,904.00</u>	\$ 13,067,496.00	
Vested Members		37,430.00	
Retired Members			
Retirement	\$ 1,094,799.00		
Disability	11,950.00		
Survivors	<u>608,601.00</u>	<u>\$ 1,715,350.00</u>	<u>\$ 14,820,276.00</u>
Unfunded Obligation			7,421,713.64
Funded Obligation			<u>\$ 7,398,562.36</u>

Public Employees Retirement Association
State of Minnesota

ACTUARIAL REQUIREMENTS
(July 1, 1965)

June 30, 1965 Census and Valuation — 3% Interest

(Police and Fire Fund)

AMORTIZATION RATE REQUIREMENT

Present Value of Benefits (For Both Past and Future Service)		\$ 29,669,180
Obligation For Service		
Rendered to Date	\$ 14,820,276	
Net Assets	7,398,562	
Accrued Unfunded Obligation	7,421,714	
Funding Ratio		50%
Amortization (32 Year) Requirement	364,013	
Covered Payroll	8,455,354	
Amortization (32 Year) Rate Requirement		<u>4.31%</u>

ENTRY AGE NORMAL RATE REQUIREMENT

Value of Benefits to be Earned in the Future	14,848,904	
Present Value of Future Payroll	78,455,300	
Normal Cost Rate Requirement	18.93%	
Employee Contribution Rate	6.00	
Employer Normal Cost Rate Requirement		<u>12.93%</u>

ACTUARIAL BALANCE

Employer Contribution Rate Set by Law		11.50%
Amortization (32 Year) Rate Requirement	4.31	
Normal Cost Rate Requirement	12.93	
Total Entry Age Normal Rate Requirement		17.24
Excess (Deficit) of Employer Contribution Rate Set by Law and Total Entry Age Normal Requirement		<u>(5.74%)</u>

Public Employees Retirement Association

State of Minnesota

(Police and Fire)

SOURCES AND USES OF FUNDS

<u>Sources</u>		<u>Uses</u>	
<u>Employee Contributions</u>	\$ 470,539.98	<u>Refunds</u>	\$ 73,682.32
<u>Employer Contributions</u>		<u>Benefits</u>	
Regular	751,469.34	Retirement	90,930.21
Advance	25,211.64	Survivor	39,407.60
		Disability	1,187.16
<u>Investment Income</u>	198,884.04	<u>Cancelled Warrants</u>	(2,752.01)
<u>Transfer from the General Fund</u>	39,284.12	<u>Expense</u>	15,592.73
<u>Investment Sales</u>		<u>Investment Purchases</u>	
Bonds	1,686,500.00	Bonds	2,498,389.74
Premium Called	3,720.70	Stock	476,461.39
Stock	540.06	Premium Paid	3,656.93
Total	\$3,176,149.88		\$3,196,556.07
Decrease in Cash Account	20,406.19		-
	<u>\$3,196,556.07</u>		<u>\$3,196,556.07</u>

Public Employees Retirement AssociationState of Minnesota(Police and Fire)RECONCILIATION OF ASSET BALANCES

Asset Balance - July 1, 1964			\$6,016,710.75
Add:			
Employer Contributions		\$898,083.05	
Employee Contributions		472,025.27	
Investment Income		206,166.51	
Transfer from the General Fund		39,284.12	
Miscellaneous Income		(1,017.80)	
Total Additions			<u>1,614,541.15</u>
			\$7,631,251.90
Deduct:			
Benefits Paid			
Retirement	\$90,930.21		
Survivor	39,407.60		
Disability	1,187.16		
Cancelled Warrants	(2,687.01)	\$128,837.96	
Refunds	73,682.32		
Return of Refunds	(65.00)	73,617.32	
Expense		15,592.73	
Total Deductions			<u>218,048.01</u>
Asset Balance - June 30, 1965			<u><u>\$7,413,203.89</u></u>

Public Employees Retirement Association

State of Minnesota

(Police and Fire)

STATEMENT OF REVENUE, EXPENDITURES,
CHANGES IN RESERVES AND EXPERIENCE GAINS (LOSS)
 (Year Ending June 30, 1965)

Revenue:

Employee Contributions		\$472,025.27	
Employer Contributions	\$872,871.41		
Advance Contributions	<u>25,211.64</u>	898,083.05	
Investment Income		204,852.74	
Estimated Gain on Sale of Securities		1,313.77	
Miscellaneous Interest		<u>(1,017.80)</u>	
Total Revenue			\$1,575,257.03

Expenditure:

Benefits		\$128,837.96	
Refund of Contributions		73,617.32	
Administrative Expense		<u>15,592.73</u>	
Total Expenditures			<u>218,048.01</u>

Increase in Assets (1964)			\$1,357,209.02
Estimated Increase in Actuarial Reserves			<u>1,558,927.76</u>
Decrease (Increase) in Unfunded Obligation			<u>\$ (201,718.74)</u>

Public Employees Retirement Association
State of Minnesota

FINANCIAL BALANCE SHEET
(Year Commencing July 1, 1965)

(Police and Fire Fund)

ASSETS

Cash - On Hand	\$ -		
On Deposit	<u>36,256.43</u>	\$ 36,256.43	
Accounts Receivable			
Member Contributions	\$ 33,459.73		
Sections 353.36	131.71		
Employer Contributions	1,570,100.23		
Interest	39,951.45		
Dividends	<u>467.84</u>	<u>\$ 1,644,100.96</u>	\$ 1,680,367.39
Less Current Liabilities			14,641.53
Net Current Assets			1,665,725.86

INVESTMENTS

Bonds			
U. S. Government	\$ 1,459,751.89		
Municipal	-		
Corporate	3,103,887.85		
Stocks			
Common	<u>\$ 1,169,196.76</u>		<u>\$ 5,732,836.50</u>
Total Assets			<u>\$ 7,398,562.36</u>

Members accumulated contributions \$3,026,511.61

Public Employees Retirement Association
State of Minnesota

FINANCIAL BALANCE SHEET
(Year Commencing July 1, 1965)

(Police and Fire Fund)

LIABILITIES

Accounts Payable	\$	14,641.53		
Retirement				
Survivor				
Refunds		0		
Expenses				
Suspense Items		0	\$	14,641.53
Less Offset Against Current Assets				<u>14,641.53</u>
				0

RESERVES

Entry Age Normal Reserves at 3-1/2% — Active Members				
Retirement	\$	19,357,055.00		
Disability		3,939,579.00		
Survivors		1,088,485.00		
Refund		<u>460,477.00</u>		
	\$	24,845,596.00		
Less Value of Benefits to be Earned in the Future	\$	<u>12,544,063.00</u>	\$	12,301,533.00
Vested Members				37,430.00
Retired Members				
Retirement	\$	1,061,955.00		
Disability		11,592.00		
Survivors		<u>590,343.00</u>	\$	<u>1,663,890.00</u>
				<u>\$14,002,853.00</u>
Unfunded Obligation				6,604,290.64
Funded Obligation				<u>\$ 7,398,562.36</u>

Public Employees Retirement Association
State of Minnesota

ACTUARIAL REQUIREMENTS
(July 1, 1965)

June 30, 1965 Census and Valuation — 3-1/2% Interest

(Police and Fire Fund)

AMORTIZATION RATE REQUIREMENT

Present Value of Benefit (For Both Past and Future Service)		\$26,546,916
Obligation For Service		
Rendered to Date	\$ 14,002,853	
Net Assets	7,398,562	
Accrued Unfunded Obligation	6,604,291	
Funding Ratio		53%
Amortization (32 Year) Requirement	346,342	
Covered Payroll	8,455,354	
Amortization (32 Year) Rate Requirement		<u>4.10%</u>

ENTRY AGE NORMAL RATE REQUIREMENT

Value of Benefits to be Earned in the Future	12,544,063	
Present Value of Future Payroll	75,317,100	
Normal Cost Rate Requirement	16.65%	
Employee Contribution Rate	6.00	
Employer Normal Cost Rate Requirement		<u>10.65%</u>

ACTUARIAL BALANCE

Employer Contribution Rate Set by Law		11.50%
Amortization (32 Year) Rate Requirement	4.10%	
Normal Cost Rate Requirement	10.65	
Total Entry Age Normal Rate Requirement		14.75
Excess (Deficit) of Employer Contribution Rate Set by Law and Total Entry Age Normal Requirement		<u>(3.25%)</u>

Police and Fire Fund

ACTUARIAL ASSUMPTIONS

While ample statistics were available, it did not appear desirable to process these for an experience analysis since an Actuarial Survey will be required by law in 1967. Consequently, the following experience factors based on Police and Fire retirement systems closely resembling the Police and Fire Employees Retirement Association were adopted for purposes of making this valuation.

Interest:	3.0%
Mortality Before Retirement:	1951 Group Annuity
After Retirement:	1965 Group Annuity
Retirement Age:	60
Disability:	See Following Table
Turnover:	See Following Table
Salary Scale:	See Following Table
1952-57 Wage Base:	Estimate based on 1952-57 contribu- tions

Age 60 was used as the average age at retirement based on our analysis of the retirement patterns of the present group.

A detailed statement of the mortality rates, disability rates, turnover factors and salary scale is set out in the following pages.

Public Employees' Retirement Association
State of Minnesota

Police and Fire Fund

All Employees

MORTALITY RATES

(Per 1,000 Employees)

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	.616	45	3.580
21	.640	46	4.065
22	.666	47	4.599
23	.693	48	5.180
24	.724	49	5.807
25	.758	50	6.475
26	.796	51	7.187
27	.838	52	7.938
28	.885	53	8.731
29	.935	54	9.563
30	.991	55	10.436
31	1.054	56	11.346
32	1.122	57	12.298
33	1.198	58	13.302
34	1.281	59	14.379
35	1.374	60	15.555
36	1.475	61	16.866
37	1.587	62	18.353
38	1.711	63	20.068
39	1.849	64	22.067
40	2.000	65	24.418
41	2.192		
42	2.450		
43	2.769		
44	3.147		

Public Employees' Retirement Association
State of Minnesota

Police and Fire Fund

All Employees

DISABILITY RATES

(Per 1,000 Employees)

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	1.70	45	10.40
21	1.75	46	11.60
22	1.80	47	12.95
23	1.86	48	14.50
24	1.92	49	16.10
25	1.98	50	17.70
26	2.05	51	19.60
27	2.12	52	21.60
28	2.19	53	23.70
29	2.27	54	25.95
30	2.35	55	28.25
31	2.50	56	30.65
32	2.70	57	33.25
33	2.95	58	36.05
34	3.20	59	38.85
35	3.50	60	41.65
36	3.90	61	44.50
37	4.30	62	47.35
38	4.75	63	50.20
39	5.25	64	53.15
40	5.90		
41	6.60		
42	7.40		
43	8.30		
44	9.25		

Public Employees' Retirement Association
State of Minnesota

Police and Fire Fund

All Employees

SEPARATION RATES

(Per 1,000 Employees)

<u>Age</u>	<u>Separation</u>	<u>Age</u>	<u>Separation</u>
20	70.0	40	24.5
21	70.0	41	21.3
22	70.0	42	18.5
23	69.9	43	16.0
24	69.8	44	13.7
25	69.7	45	11.8
26	69.4	46	10.2
27	68.9	47	8.7
28	68.0	48	7.3
29	67.0	49	6.1
30	65.8	50	5.0
31	64.3	51	3.9
32	62.4	52	2.9
33	59.8	53	2.2
34	56.1	54	1.5
35	51.1	55	1.1
36	45.4	56	.7
37	39.5	57	.5
38	33.6	58	.3
39	28.7	59	.1

Public Employees' Retirement Association
State of Minnesota

Police and Fire Fund

All Employees

EARNINGS PROGRESSION

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	.4102	45	.6730
21	.4184	46	.6864
22	.4268	47	.7002
23	.4353	48	.7142
24	.4440	49	.7284
25	.4529	50	.7430
26	.4619	51	.7579
27	.4712	52	.7730
28	.4806	53	.7885
29	.4902	54	.8043
30	.5000	55	.8203
31	.5100	56	.8368
32	.5202	57	.8535
33	.5306	58	.8706
34	.5412	59	.8880
35	.5521	60	.9057
36	.5631	61	.9238
37	.5744	62	.9423
38	.5859	63	.9612
39	.5976	64	.9804
40	.6095	65	1.0000
41	.6217		
42	.6342		
43	.6468		
44	.6598		

Public Employees Police and Fire Fund
State of Minnesota

SUMMARY OF PLAN

1. Name

Public Employees Police and Fire Fund.

2. Type of Plan

Self-insured, managed by a 12 member Board of Trustees consisting of the State Auditor, State Insurance Commissioner, State Treasurer, and nine others elected from the membership of the Association.

3. Employers Included

Any county, city, village, borough, town, school district within the State, or a department or unit of the State or any other public body employing any person who is a public employee as defined by the Law.

4. Employees Included

All full-time police officers and fire fighters, except those on a per diem basis, of an eligible employer who are not contributing to another plan.

5. Service Considered

All periods of service in which salary deductions were made or for which payments in lieu of salary deduction were deposited, including seasonal layoff and authorized sick leaves.

6. Earnings Considered

(a) For service prior to July 1, 1957, average of highest consecutive 5 years prior to such date, not to exceed \$4,800.

(b) For service during the period July 1, 1957 to July 1, 1965, all earnings not to exceed \$4,800 in any calendar year.

(c) After July 1, 1965, all earnings not to exceed \$6,000 in any calendar year.

(d) Earnings considered for determining benefit under the law in force prior to 1957 shall be the average annual earnings during the 10-year period immediately preceding retirement.

7. Employer Contributions

Police and Fire - Amount equal to 9% of total considered earnings for current service plus 2-1/2% of total considered earnings to amortize past service costs.

8. Employee Contributions

- (a) For service prior to July 1, 1957, 4% of considered earnings.
- (b) After July 1, 1957, 6% of considered earnings.

9. Normal Retirement Benefit

After attainment of age 58 and completion of 10 years of service.

Police and Fire - Annuity equal to the sum of:

- (a) 2% of considered earnings for each of the first ten years plus;
- (b) 2% of considered earnings for each of the second ten years plus;
- (c) 2% of considered earnings for each of the third ten years.
- (d) 1% of considered earnings for each year over thirty.

or any person who was a member of the association on June 30, 1957 and who thereafter becomes a member of the police and fire fund may elect to receive a benefit computed under the law in force prior to June 30, 1957 without maximum limitation.

10. Late Retirement Benefit

Annual annuity determined as for Normal Retirement, considering Service and Earnings to actual retirement.

11. Disability Benefit

In event of total and permanent disability after completion of 10 years of service or attainment of age 50 and completion of 5 years of service.

Annual Annuity determined as for Normal Retirement, considering Service and Earnings to date of disablement, plus a supplement as follows:

Under 51	\$50
51	44
52	38
53	32
54	26
55	20
56	12
57	6

In event of duty disablement of Police or Firemen, a minimum of 40% of average salary, regardless of age or service.

12. Death Benefit

Active - In event of death after 18 months of service.

Annual Annuity to dependent spouse of 30% of average salary not to exceed \$65 per month, plus for each dependent child under age 18, 20% of average salary not to exceed \$45 per month, plus 10% of average salary not to exceed \$20 per month to be divided among dependent children. Maximum family benefit equal to lesser of \$250 per month or 100% of average salary.

In lieu of above benefit, if employee has completed 20 years of service, a 75% survivor benefit for spouse payable at age 62. Maximum benefit \$150 per month. If employee was under age 58 benefit is reduced 1/2% for each month that he was under age 58.

Any employee not eligible for above benefits, his contributions with interest at 2% shall be paid to his beneficiary.

Retired

(a) Under law in force July 1, 1957 and prior, 50% of his annuity continued to his beneficiary provided his beneficiary is his surviving spouse and has attained age 60, and has not remarried; or is the parent of the retired member.

(b) Under law in effect July 1, 1957 and subsequent, refund of contributions less benefit paid to date of death.

13. Separation Benefit

In event of termination after 10 years of service, a deferred vested benefit payable at age 58, provided participant does not withdraw contribution.

Annual Annuity determined as for Normal Retirement considering Service and Earnings to date of termination. In lieu of annuity, participant shall receive a refund of contributions without interest.

14. Optional Benefits

A participant may elect to receive an equivalent actuarially reduced annuity in the form of a joint and survivor annuity or a period certain and life thereafter annuity.

15. Expenses

Paid by Association from retirement fund.

16. Actuarial Method

For purpose of reports to the Legislative Commission, costs for the Plan shall be determined on an "entry-age level normal cost" basis amortizing the unfunded accrued liability over 40 years from 1957, 3% interest.

**Public Employees Retirement Association
State of Minnesota**

Police and Fire Fund

CONSIDERED EARNINGS

Active Male Employees

(Age and Service as of July 1, 1965)

AGE	YEARS OF SERVICE							
	UNDER 1		1		2 - 4		5 - 9	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	2	7,200	14	57,849	6	27,999	-	-
25-29	11	34,093	48	199,690	78	313,253	19	58,476
30-34	8	23,298	37	164,170	97	467,625	65	326,103
35-39	32	83,183	25	114,579	72	351,472	89	468,023
40-44	30	83,979	19	86,939	59	316,694	65	371,113
45-49	27	69,734	18	78,797	40	204,967	44	264,046
50-54	23	59,557	12	59,213	33	174,785	36	210,362
55-59	41	113,104	11	49,465	22	122,773	21	121,914
60-64	18	47,031	8	34,289	16	62,615	14	84,448
65-69	1	2,970	2	6,200	4	13,116	4	27,095
70&UP	-	-	-	-	-	-	1	9,724
	193	524,149	194	851,191	427	2,055,299	358	1,941,304

AGE	YEARS OF SERVICE							
	10 - 14		15 - 19		20 - 24		25 - 29	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	-	-
25-29	2	4,799	-	-	-	-	-	-
30-34	30	152,204	3	15,032	-	-	-	-
35-39	49	255,576	20	108,707	7	35,871	-	-
40-44	49	287,228	26	152,180	9	49,019	4	23,386
45-49	44	279,449	28	166,574	16	97,422	3	18,700
50-54	30	211,809	21	149,165	12	76,695	9	68,262
55-59	23	170,911	19	142,909	11	76,844	6	43,592
60-64	14	86,020	16	93,784	11	53,341	5	37,095
65-69	8	49,657	9	64,190	7	68,068	2	12,124
70&UP	6	32,920	1	2,400	1	9,724	-	-
	255	1,530,573	143	894,941	74	466,984	29	203,159

AGE	YEARS OF SERVICE						
	30 - 34		35 - 39		40 & OVER		ALL
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO. EARNINGS
TO 25	-	-	-	-	-	-	22 93,048
25-29	-	-	-	-	-	-	158 610,311
30-34	-	-	-	-	-	-	240 1,148,432
35-39	-	-	-	-	-	-	294 1,417,411
40-44	-	-	-	-	-	-	261 1,370,538
45-49	10	66,163	-	-	-	-	230 1,245,852
50-54	8	61,357	5	38,212	-	-	189 1,109,417
55-59	7	50,334	2	16,601	13	85,196	176 993,643
60-64	8	62,881	7	60,897	6	56,110	123 678,511
65-69	3	24,063	1	9,724	4	38,896	45 316,103
70&UP	1	9,724	-	-	2	19,448	12 83,940
	37	274,522	15	125,434	25	199,650	1750 9,067,206

Average Age 44.15

Average Service 8.88

Average Entry Age 35.27

Public Employees Retirement Association
State of Minnesota

Police and Fire Fund

CONSIDERED EARNINGS

Active Female Employees
(Age and Service as of July 1, 1965)

AGE	YEARS OF SERVICE							
	UNDER 1		1		2 - 4		5 - 9	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	-	-
25-29	-	-	-	-	1	4,368	2	4,420
30-34	-	-	-	-	-	-	-	-
35-39	1	1,600	-	-	2	7,411	-	-
40-44	-	-	-	-	-	-	1	3,865
45-49	1	1,600	1	6,809	1	6,945	1	4,400
50-54	1	2,400	-	-	2	3,400	-	-
55-59	1	1,600	-	-	-	-	-	-
60-64	-	-	-	-	-	-	4	11,507
65-69	-	-	-	-	-	-	-	-
70&UP	-	-	-	-	-	-	-	-
	4	7,200	1	6,809	6	22,124	8	24,192

AGE	YEARS OF SERVICE							
	10 - 14		15 - 19		20 - 24		25 - 29	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-
40-44	1	6,290	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-
50-54	1	3,748	-	-	-	-	-	-
55-59	2	11,334	1	1,950	-	-	-	-
60-64	-	-	1	9,533	1	1,745	-	-
65-69	-	-	1	1,600	-	-	-	-
70&UP	-	-	-	-	-	-	-	-
	4	21,372	3	13,083	1	1,745	-	-

AGE	YEARS OF SERVICE							
	30 - 34		35 - 39		40 & OVER		ALL	
	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS	NO.	EARNINGS
TO 25	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	3	8,788
30-34	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	3	9,011
40-44	-	-	-	-	-	-	2	10,155
45-49	-	-	-	-	-	-	4	19,754
50-54	-	-	-	-	-	-	4	9,548
55-59	-	-	-	-	-	-	4	14,884
60-64	-	-	-	-	-	-	6	22,785
65-69	-	-	-	-	-	-	1	1,600
70&UP	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	27	96,525

Average Age 50.09

Average Service 7.76

Average Entry Age 42.33

Public Employees' Retirement Association
State of Minnesota

Police and Fire Fund

Retired Under the Law in Force Prior to July 1, 1957

<u>Age</u>	Male		Female	
	Number	Monthly Annuity	Number	Monthly Annuity
66	2	\$ 370.05		
67	2	385.28	1	\$168.38
68	5	698.93		
69	8	1,511.79		
70	1	138.01	1	199.89
71	3	554.34		
72	1	191.15		
74	3	429.82		
76	1	155.39		
77			1	276.10
78			1	272.24
88	1	31.68	—	—
<u>Totals</u>	<u>27</u>	<u>\$4,466.44</u>	<u>4</u>	<u>\$916.61</u>

Public Employees' Retirement Association
State of Minnesota

Police and Fire Fund

Retired Under Law in Force July 1, 1957 and Subsequent

<u>Age</u>	<u>Males Number</u>	<u>Monthly Annuity</u>
59	1	\$ 91.45
61	3	210.32
62	1	75.12
63	1	230.00
64	4	377.85
65	1	51.81
66	4	215.84
67	1	199.61
68	3	232.03
69	3	203.98
70	2	129.47
71	3	194.35
72	3	226.79
73	2	127.53
<u>Total</u>	<u>32</u>	<u>\$2,566.15</u>

Police and Fire Employees

Disability Retirements Annuities

<u>Age</u>	<u>Males Number</u>	<u>Monthly Annuity</u>
53	1	\$ 98.93

Public Employees' Retirement Association
State of Minnesota

Police and Fire Fund

Survivor Annuities

<u>Without Children</u>			<u>Widows and Children</u>		
<u>Age</u>	<u>Number</u>	<u>Total Monthly Annuity</u>	<u>Age</u>	<u>Number</u>	<u>Total Monthly Annuity</u>
42	1	\$ 65.00	25	1	\$130.00
47	2	130.00	32	1	155.00
49	1	65.00	35	1	250.00
52	1	65.00	37	1	245.00
54	1	65.00	47	4	610.00
56	2	130.00	48	2	260.00
57	1	65.00	51	1	130.00
58	1	65.00	52	1	175.00
59	2	130.00	56	1	177.32
61	1	65.00			
65	1	65.00	<u>Total</u>	<u>13</u>	<u>\$2,132.32</u>
66	3	226.77			
69	1	26.28			
70	1	65.00			
75	1	65.00			
77	1	76.14			
79	1	63.00			
<u>Total</u>	<u>22</u>	<u>\$1,432.19</u>			

PERA VALUATION AS OF JUNE 30, 1965

(General Fund)

The purpose of this memorandum is to discuss the valuation report of the Public Employees' Retirement Association, dated November 22, 1965, which was submitted to the Commission in accordance with Chapter 359 of Minnesota Laws 1965. The valuation was made using the entry age normal cost method and assuming 3% interest. The 1965 valuation report was completed by Arthur Stedry Hansen, Consulting Actuaries. Our office completed a similar valuation at the instruction of the Commission as of June 30, 1963.

This memo contains the following:

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

(Reference can be made to our report of March 12, 1965 for a similar discussion of the actuarial valuation as of June 30, 1963.)

1. Statistical and Valuation Data

Results of the valuation reports as of June 30, 1963 and June 30, 1965 are shown for comparative purposes. Figures are rounded where necessary for simplicity of presentation.

	As of <u>June 30, 1963</u>	As of <u>June 30, 1965</u>
(1) Membership		
Active Members	40,413	42,025 (A)
Retired Members	3,855	4,344
Disabled Members	97	133
Survivors of Deceased Members	(Not Available)	1,780

(A) Active members as of June 30, 1965 includes 1,929 Hospital employee members covered by Social Security and PERA with reduced benefits compared with benefits of non-Hospital employees.

	As of June 30, 1963	As of June 30, 1965
(2) <u>Payroll and Annuities Payable</u>		
Total Payroll (no limit)	(Not Available)	\$ 168.0 Million*
Covered Payroll (subject to \$4,800 limit in 1963 valuation; \$6,000 in 1965 valuation)	\$ 139.0 Million	155.0 Million*
Annuities Payable (annual)	6.5 Million	8.0 Million

* Estimated

(3) Valuation Balance Sheet

Accrued Liability	\$ 205 Million	\$ 274 Million
Assets	100 Million	126 Million
Unfunded Accrued Liability (Deficit)	\$ 104 Million	\$ 148 Million

Funding Ratio (ratio of Assets to Accrued Liability)	49%	46%
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(4) Normal Cost and Funding Costs

	% of Covered Payroll	% of Covered Payroll
Normal Cost	9.4%	10.1%
Normal Cost	9.4%	10.1%
Interest on Deficit	2.3%	2.9%
Total ("Minimum Contribution")	11.7%	13.0%
Normal Cost	9.4%	10.1%
Amortization by 1997	3.5%	4.7%
Total ("Required Contribution")	12.9%	14.8%

(5) Statutory Contributions

Employee	6.0%	6.0%
Employer Regular	6.0%	6.0%
Employer Additional	2.5%	2.5%
Total Contributions	14.5%	14.5%

(6) Investment Yield (A) (Not Available) 3.39%

(A) Ratio of reported investment income (\$3,996,181) to mean reported assets for fiscal year. After deduction of administrative expenses (\$345,577), the ratio is reduced to 3.09% for the year ended June 30, 1965. It would appear that the administrative expenses will not increase as rapidly as investment income so that for future years the difference between the ratios will be smaller.

2. Discussion of Valuation Results

(1) Changes in Plan

The 1965 Legislature enacted some significant amendments to the law governing PERA. These are outlined below:

- (a) Covered Payroll: increased from \$4,800 limit to \$6,000 limit.
- (b) Retirement Benefit: increased in accordance with increased covered earnings (for future service only).
- (c) Disability Benefit: same type of increase as Retirement Benefit.
- (d) Savings Clause: This was extended to those who were covered 6-30-57, giving them 10% of the difference between the Old Law formula and the New Law formula (maximum 100%), (formerly granted only to those with ten or more years of service).
- (e) Buy-Back: The privilege of "buying back" prior service was reinstated, subject to 6% matching employee and employer contributions and 4% interest for such prior service. (The valuation report specifically does not make allowance for any possible additional obligation because of its indeterminate nature. In our opinion, such additional obligation would be quite small.)

(2) Analysis of Normal Cost

The 1965 valuation produced a normal cost of 10.1% of covered payroll as compared to 9.4% in 1963. This increase is brought about by several factors, some of which tend to increase normal cost and some of which tend to decrease it.

Factors tending to increase the normal cost are:

- (a) Benefit increases: As a result of the increase in covered payroll, prospective retirement and disability benefits have been increased.
- (b) Savings Clause Extension: Certain members will receive higher retirement benefits as a result of this law.
- (c) Actuarial Assumptions: The PERA actuaries have adopted more conservative mortality tables in this 1965 valuation than our office used in the 1963 valuation. They have used the "1965 Group Annuity Table" for mortality after retirement, while we used the PERA experience table published in 1963 in our valuation. As an example of how this change in assumptions affects normal cost, the following table shows the cost of a \$100 monthly annuity at age 65 for men (3% interest assumed):

1965 GA Table	\$ 13,980
PERA Experience Table	13,651

This represents an increase of 2.5% in the cost of the retirement benefit element of normal cost. (Note: This is 2.5% of the benefit cost, not of payroll.) We feel that the PERA actuaries are justified in their use of the 1965 GA Table in that it provides for expected increases in longevity. Their comment in Appendix 1 of their report is that a complete Actuarial Survey under the law will be completed in 1967, so that they have used "experience factors based on public retirement systems closely resembling PERA".

Factors tending to decrease the normal cost are:

- (a) Increase in covered payroll: The increases in benefits are granted in respect to future service only, while the increase in covered payroll is effective immediately. The normal cost in dollars, therefore, when related to a larger payroll, results in a lower percentage of payroll.
- (b) Salary Scale: The PERA actuaries have assumed a 2% per year earnings increase, which is somewhat lower than the rate of increase assumed in our valuation.

The net result of these factors is an increase in the normal cost from 9.4% to 10.1% of covered payroll, a percentage increase of 7.5%.

(3) Analysis of Change in Deficit (Unfunded Accrued Liability)

The deficit has increased from \$104 million to \$148 million, an increase of \$44 million in the two-year period.

This increase is the net result of several factors which have been discussed under "Analysis of Normal Cost" in this memorandum.

An important consideration should be noted by members of the Commission: an increase in Benefits causes an immediate increase in Accrued Liabilities under the Entry Age Normal Cost Method of funding. All of this increase is added to the deficit since no advance funding has been done in anticipation of the increase.

(See the memo of February 11, 1965, for an example of this effect.)

Similarly, a change to more conservative actuarial assumptions will be reflected in increased Accrued Liabilities, and all of the increase will be reflected in an increased deficit. For example, our valuation as of June 30, 1963, contained an element of Accrued Liability for Retirement Benefits (active members) of \$122 million. If we had used the 1965 GA Mortality Table rather than the PERA Experience Table, this Accrued Liability would have been approximately 2.5% greater, or about \$3 million. Similarly, there would have been an increase in the Accrued Liability for Annuitants, which we showed as \$67 million. The increase would have been about \$2 million. Each of these increases in Accrued Liability adds directly to the deficit.

The extension of the Savings Clause granted an increase in prospective retirement benefits to those members who had been covered by PERA as of June 30, 1957, but had less than ten years of service as of that date. A sizeable part of the total increase in deficit was due to this extension of the Savings Clause. The PERA actuaries have analyzed the effect of increase in benefits on an approximate basis. Their letter of January 13 addressed to us as Commission actuaries states the following:

"Estimate of Additional Cost of Granting
Old Law Benefits for Less Than
10 Years of Service Prior to 1957

In accordance with your inquiry, we have attempted to estimate the additional outlay which was required on account of the fact that the legislature granted additional benefits on a proportionate basis to employees with less than 10 years of service prior to 1957. In our machines, this was not calculated as a separate element and consequently we could only approximate the amount allowed for in the valuation on this account.

We would estimate that the cost of this change was to add \$8 million to the obligation for the General Fund employees and \$750,000 to the Police and Fire employees. These figures appear to be substantially below prior estimates but seem quite reasonable when measured against the value of the benefits provided under this legislation.

The benefit granted for service prior to 1957 is primarily a 50% widow's benefit with some modest adjustment for additional pensions. This increased the obligation to employees with 10 or more years of service prior to 1957 by approximately 35%. Adjusting this proportionately for the employees with smaller periods of service and making a separate allowance for females brought us to the above figure."

In addition to the above comments on the increase in deficit, a period of two years has transpired between the two valuations. Any actual experience gains and losses of the fund arising from mortality, withdrawal and disability as well as interest earnings affect the accrual of assets and liabilities and hence the deficit. No attempt has been made to measure these gains and losses in this report. Future valuations on a consistent basis should be analyzed to show these effects.

(4) Analysis of Contributions and Funding Costs

The PERA actuaries in their Valuation Report state the following:

"It is our conclusion that the General Fund is in reasonable actuarial balance and that the benefits earned during the year 1965-1966 could be provided by the combined employer-employee 14.5% contribution rate. To remain actuarially sound and to meet the statutory requirement of full funding by 1997. However, the Employers must continue to not only match the current employee contribution but also levy an additional 2.5% to finance the benefits earned prior to 1957."

In Exhibit 2 of their Report (page 11), the numerical results of the valuation are summarized. They may be stated in the following form (as percentages of covered payroll).

<u>Costs</u>	
Normal Cost	10.11%
Amortization Requirement	<u>4.68</u> (32 years; i. e., by 1997)
Total	14.79%
 <u>Contributions</u>	
Employee Regular	6.00%
Employer Regular	6.00
Employer Additional	<u>2.50</u>
Total	14.50%

(5) Valuation Results Based on 3 1/2% Interest

The PERA Valuation Report contains valuation results on a 3 1/2% basis as well as the required 3% basis. These results are shown in Exhibits 1a and 2a of the Report. They are summarized below (as percentages of covered payroll).

<u>Costs</u>	
Normal Cost	8.90%
Amortization Requirement	<u>4.39</u>
Total	13.29%

Total statutory contributions are 14.50% including the 2.50% additional employer contribution.

As noted on page 2 of this memo, the investment yield on mean assets of the fund was 3.09% after deduction of administrative expenses from investment income.

(6) Financial Report - Income Statement

Exhibit 5 of the Valuation Report is also shown in the Financial Report ("Thirty-Fourth Annual Report") as a "Statement of Income, Deductions, Additions to Reserves and Experience Gain (Loss)".

The last item of this Exhibit is a "deduction" labelled "Estimated Increase in Actuarial Reserves". This is of necessity an estimated amount (shown to be \$11.3 million). It could not be determined on other than an estimated basis because no valuation had been made as of June 30, 1964.

However, we feel that the estimated amount should be considerably larger because of the 1965 laws which added substantial liabilities to PERA. These 1965 changes are discussed above in this memo. The extension of the Savings Clause alone accounted for approximately \$8 million of additional liability.

Use of a larger "Estimated Increase in Actuarial Reserves" would, we feel, have been appropriate. This would be reflected by an "Increase in Unfunded Obligation" rather than the "Decrease" of \$1.4 million shown in the Report.

3. Conclusion

This valuation report filed by PERA conforms with the requirements of Chapter 359 in its most important aspects.

In our opinion, the conclusion reached by the PERA actuary, as stated above, is reasonable.

Gerald G. Toy
Fellow, Society of Actuaries
GEORGE V. STENNES AND ASSOCIATES
Commission Actuaries