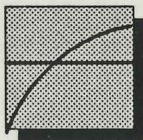




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**St. Paul  
Police Relief Association**

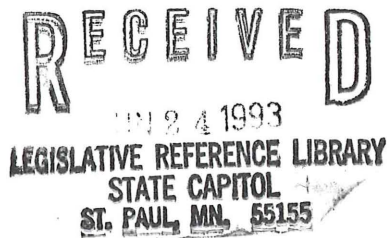


**Annual Actuarial Valuation  
December 31, 1992**

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1992

**Gabriel, Roeder, Smith & Company  
Actuaries and Consultants**

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Appendix I Financial Principles and Operational Techniques

Appendix II Meaning of Unfunded Accrued Liabilities

May 21, 1993

Board of Trustees  
St. Paul Police Relief Association  
St. Paul, Minnesota

Submitted in this report are the results of the December 31, 1992 actuarial valuation of the assets, actuarial values and contribution requirements associated with the benefits provided by the St. Paul Police Relief Association.

The valuation results contained in Section A provide the actuarial information needed to determine the employer's "minimum obligation" effective January 1, 1994. Section A also contains comments regarding the valuation results.

The valuation was based upon information furnished by the Association concerning benefits, financial transactions, active members, terminated members, retirants and beneficiaries. Data was checked for year to year consistency but was not otherwise audited by us. This information is summarized in Section B.

A description of the actuarial funding method and the risk experience assumptions used is contained in Section C. The economic risk experience assumptions, as well as the actuarial funding method to be used, are established by state law.

Information needed to comply with Statement No. 5 of the Governmental Accounting Standards Board is contained in Section D.

The actuarial valuation was prepared using generally accepted actuarial principles and practices based upon the methods, assumptions, summary of plan provisions and the member and financial data described in this report.

Respectfully submitted,

  
J. Daniel Petersen

  
Gary W. Findlay

## **Section A**

### **Valuation Results**



## COMMENTS

### Economic Assumptions and Financing Method

The economic assumptions of 5% annual investment return and 3-1/2% annual salary increases are established by state law. State law also specifies that the annual minimum obligation of the municipality shall be determined by adding (i) the employer normal cost percent times covered payroll to (ii) the level dollar amount required to amortize the unfunded actuarial accrued liability by December 31, 2010.

It is worth noting that when the same assumptions and methods are applied to plans which differ in nature, the valuation results may not be comparable. Caution should be exercised when attempting to assess the financial condition of one Association relative to another on the basis of valuation results produced using the assumptions and methods mandated by state law.

### Determining Actuarial Value of Assets

In 1984, a state law was enacted which prescribes the method to be used in determining the value of assets for purposes of an actuarial valuation. Specifically, the law states that the actuarial value of assets will be the book value plus one-third of the amount derived by subtracting book value from market value. In previous years, the book value of investments was not readily available. However, the book value of investments was provided as of December 31, 1992 and was used to determine valuation assets in accordance with State law.

St. Paul Police Relief Association  
CONTRIBUTION RATE TO PROVIDE BENEFITS

Member portion & Employer portion  
Effective January 1, 1994

<u>Contributions for</u>	<u>If Paid Equally Throughout Year</u>	
	<u>Normal Cost</u> <u>% of Active</u> <u>Payroll for 1993</u>	<u>UAAL Dollars</u>
Normal cost of annuities:		
Age & service: to members	15.43%	
Age & service: to survivors	3.07	
Disability	2.15	
Death before retirement	1.99	
Refunds of member contributions	0.00	
Total Normal Cost	22.64%	
Amortization of unfunded actuarial accrued liabilities (UAAL) (17 year level dollar payment)		
Retired lives		\$ 0
Active members		<u>4,520,937</u>
Total		4,520,937
Total Cost of Benefits	22.64%	+ \$4,520,937
Member contributions	8.00%	
COMPUTED EMPLOYER RATE:		
(a) If Paid Equally Throughout Year	14.64%	+ \$4,520,937
(b) IF PAID AT CALENDAR YEAR END	15.00%	4,632,582

St. Paul Police Relief Association  
Present Actuarial Condition

---

The Association's accrued actuarial assets were in excess of \$150.6 million on December 31, 1992 -- a considerable sum of money if unencumbered and allocated among a small group of persons. This is not the case with the Association's assets.

The following schedule puts the \$150.6 million into perspective by showing the relationship between accrued actuarial assets, actuarial accrued liabilities, and the number of persons with actual and potential claims on the Association's assets.

	<u>Accrued Actuarial Assets</u>	<u>Actuarial Accrued Liabilities</u>	<u>Unfunded Actuarial Accrued Liabilities</u>	<u>% Funded</u>
Retirants and Beneficiaries				
Retired Members (280)		\$ 87,601,812		
Surviving Spouses (139)		18,305,148		
Surviving Children (10)		<u>107,808</u>		
Total (429)		106,014,768		
Deferred Members (9)		3,486,516		
Active Members (352)		<u>93,356,210</u>		
Total	\$150,624,273	\$202,857,494	\$52,233,221	74.3%

Actuarial accrued liabilities represent the value, computed as of December 31, 1992 of:

- (i) retirement allowances likely to be paid the 429 retirants and beneficiaries; and
- (ii) the contributions assumed to have been made for the 352 active members from entry into the plan until December 31, 1992.

The value of retirement allowances likely to be paid the 429 retirants and beneficiaries, discounted for investment earnings and mortality, was computed to be \$106,014,768 as of December 31, 1992. To put this amount in perspective, the \$106,014,768, together with investment earnings, will just be sufficient to pay the 429 retirants and beneficiaries their allowances for their remaining lifetimes. This assumes the 429 retirants and beneficiaries live and die according to the assumed mortality and the \$106,014,768 is invested to yield an average annual return of 5.0% over the remaining lifetimes of the retirants and beneficiaries.

With respect to the active members, the actuarial accrued liability of \$93,356,210 represents the amount that would have been accumulated by December 31, 1992. This assumes the normal cost (which is expressed as a level percentage of pay) had been contributed from the date of hire until December 31, 1992 for the 352 actives, and that these amounts had earned 5.0% interest. It also assumes that the members in the past have lived, died, withdrawn, retired and received salary increases according to the actuarial assumptions shown in this report.

#### Historical Funding Ratio Schedule (\$ in thousands)

<u>Valuation Date December 31</u>	<u>Actuarial Accrued Liabilities</u>	<u>Accrued Actuarial Assets</u>	<u>Percent Funded</u>
1983*	\$117,502	\$44,614	38.0%
1984	121,721	50,828	41.8
1985	126,461	65,093	51.5
1986	132,699	74,796	56.4
1987	144,819	80,867	55.8
1988	151,354	92,598	61.2
1989#	182,294	116,547	63.9
1990	195,933	118,437	60.4
1991	195,477	147,020	75.2
1992	202,857	150,624	74.3

\* After change in assumptions.

# After change in benefit provisions



St. Paul Police Relief Association  
 Computed Contributions - Comparative Schedule

---

<u>Year Ended</u> <u>December 31</u> <u>Valuation</u>	<u>Fiscal</u>	<u>Total Normal Cost</u> <u>as a Percent of</u> <u>Valuation Payroll*</u>	<u>Contribution For</u> <u>Unfunded Actuarial</u> <u>Accrued Liabilities</u>
1983	1985**	22.88%	\$4,947,768
1984	1986	22.82	4,908,311
1985	1987	22.34	4,339,786
1986	1988	22.31	4,188,901
1987	1989	22.26	4,740,907
1988	1990	22.27	4,471,859
1989	1991#	23.70	5,148,028
1990	1992	22.63	6,257,272
1991	1993	22.68	4,044,957
1992	1994	22.64	4,520,937

\* Includes employee contributions.

\*\* After change in assumptions.

# After change in benefit provisions.

St. Paul Police Relief Association

CONTRIBUTION FOR CALENDAR YEAR EFFECTIVE JANUARY 1, 1994

---

For any period of time the percent-of-payroll contribution rate is converted to dollars. The amount of dollars for any calendar year depends upon the results of the last actuarial valuation, and the timing of contributions within the year. The later the contribution date, the greater the dollar amount will be.

The municipality's dollar contribution for the year may be determined as follows:

(1)	Estimated covered payroll for 1994		\$ _____
(2)	Total normal cost % from page A-2		22.64%
(3)	Total normal cost (Line 1 times line 2)		\$ _____
(4)	_____ x 1.035 1992 Administrative expenses paid from the Special Fund		_____
(5)	Amortization payment on UAAL from page A-2		4,520,937
(6)	Total contributions required (Line 3 plus line 4 plus line 5)		_____
(7)	Employee contributions (Line 1 times 8%)		\$ _____
(8)	(a) State amortization aid based on 12/31/78 UAAL of \$53,307,132	\$807,767	
	(b) State amortization aid based on 1984 legislation	<u>117,202</u>	
	(c) Total State amortization aid		924,969
(9)	Estimated insurance premium aid		_____
(10)	Estimated total contributions from other sources (Line 7 plus line 8 plus line 9)		_____
(11)	Employer's Minimum Obligation if payment is made in equal installments throughout the year (Line 6 minus line 10)		\$ _____
(12)	EMPLOYER'S MINIMUM OBLIGATION IF PAYMENT IS MADE IN TWO EQUAL INSTALLMENTS, JULY 30 & DECEMBER 30 (Line 10 times 1.014408)		\$ _____

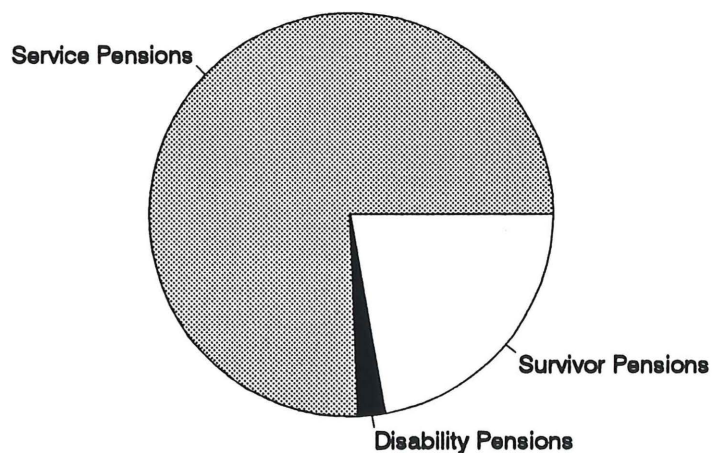
**Section B**

**Valuation Data  
and  
Summary of Benefit Provisions**

St. Paul Police Relief Association  
Retirants and Beneficiaries December 31, 1992  
By Type of Annuity Being Paid

---

<u>Type of Annuity Being Paid</u>	<u>No.</u>	<u>Monthly Amounts</u>	<u>Computed Actuarial Accrued Liabilities</u>
Retirants receiving:			
Age & Service	269	\$504,269.37	\$ 84,369,348
Disability	<u>11</u>	<u>14,577.12</u>	<u>3,232,464</u>
Totals	280	518,846.49	87,601,812
Beneficiaries receiving:			
Spouse	139	145,866.60	18,305,148
Child	<u>10</u>	<u>1,908.00</u>	<u>107,808</u>
Totals	149	147,774.60	18,412,956
Totals	<u>429</u>	<u>\$666,621.09</u>	<u>\$106,014,768</u>



Monthly Amount Paid by Benefit



**St. Paul Police Relief Association**  
**Inactive Members Eligible for Deferred Benefits**  
**December 31, 1992**

---

<u>No.</u>	<u>Monthly Amount</u>	<u>Computed Actuarial Accrued Liabilities</u>
9	\$13,737.60	\$3,486,516

St. Paul Police Relief Association  
Retirants and Beneficiaries December 31, 1992  
By Attained Ages

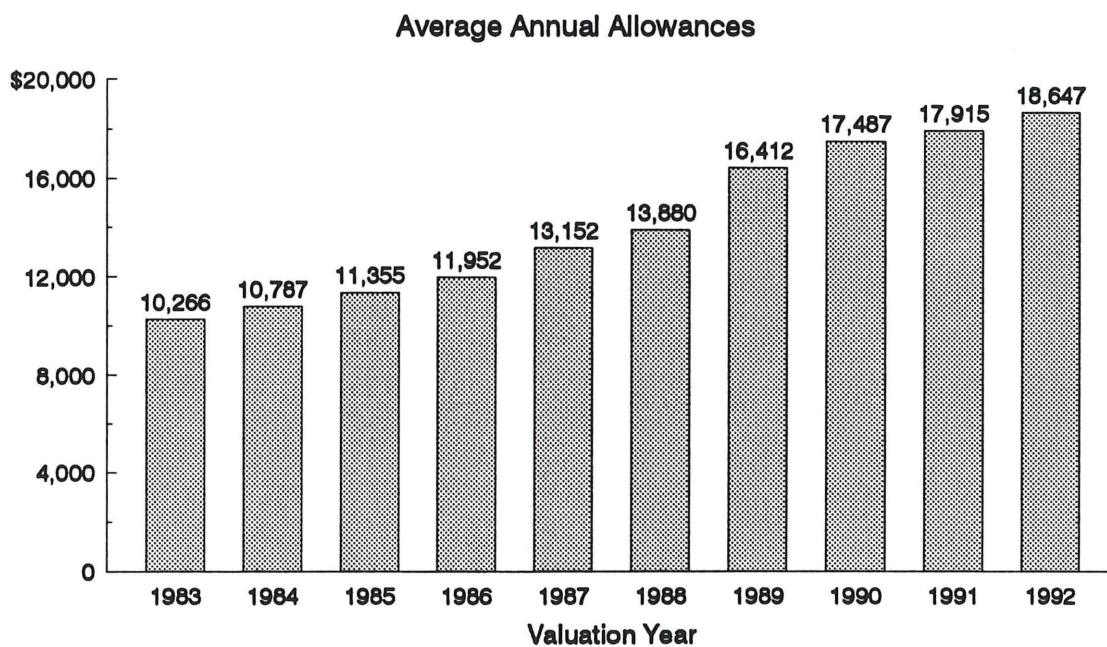
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<u>Attained Ages</u>	<u>Number</u>		<u>Death Before Retirement</u>
	<u>Age &amp; Service</u>	<u>Disability</u>	
Under 20			7
20-24			3
35-39		1	
40-44			1
45-49	1	2	5
50-54	23	2	3
55-59	23	2	2
60-64	49	2	6
65-69	91	3	9
70-74	56	3	6
75-79	50	1	2
80-84	29		3
85-89	24	1	2
90-94	10		2
95-99	<u>3</u>	<u>—</u>	<u>2</u>
Totals	359	17	53

**St. Paul Police Relief Association**  
**Retirants and Beneficiaries Added to and Removed from Rolls**  
**Comparative Statement**

---

<u>Valuation Date December 31</u>	<u>No. Added to Rolls</u>	<u>No. Removed from Rolls</u>	<u>Rolls End of Year No.</u>	<u>Annual Allowances</u>	<u>Discounted Value of Total Allowances</u>
1983	28	23	436	\$4,475,940	\$63,716,560
1984	20	23	433	4,670,886	64,107,551
1985	11	19	425	4,825,712	64,862,316
1986	25	20	430	5,139,463	68,638,536
1987	15	22	423	5,563,215	73,312,416
1988	20	18	425	5,899,181	76,536,972
1989	25	12	438	7,188,518	96,716,616
1990	23	20	441	7,711,576	103,294,692
1991	22	28	435	7,793,231	104,223,492
1992	12	18	429	7,999,453	106,014,768



St. Paul Police Relief Association  
Active Members December 31, 1992  
By Attained Age and Years of Service

---

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
30-34			3					3	\$ 137,376
35-39			30	18				48	2,198,016
40-44			14	37	31			82	3,754,944
45-49			5	19	78	19		121	5,540,832
50-54			1	5	25	37	1	69	3,159,648
55-59				1	2	11	4	18	824,256
60							3	3	137,376
61					1	1	1	1	45,792
62							1	3	137,376
63							1	1	45,792
64							1	1	45,792
65							1	1	45,792
66			—	—	—	—	1	1	45,792
Totals			53	80	137	68	14	352	\$16,118,784

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 46.3 years.

Service: 21.0 years.

Annual Pay: \$45,792.



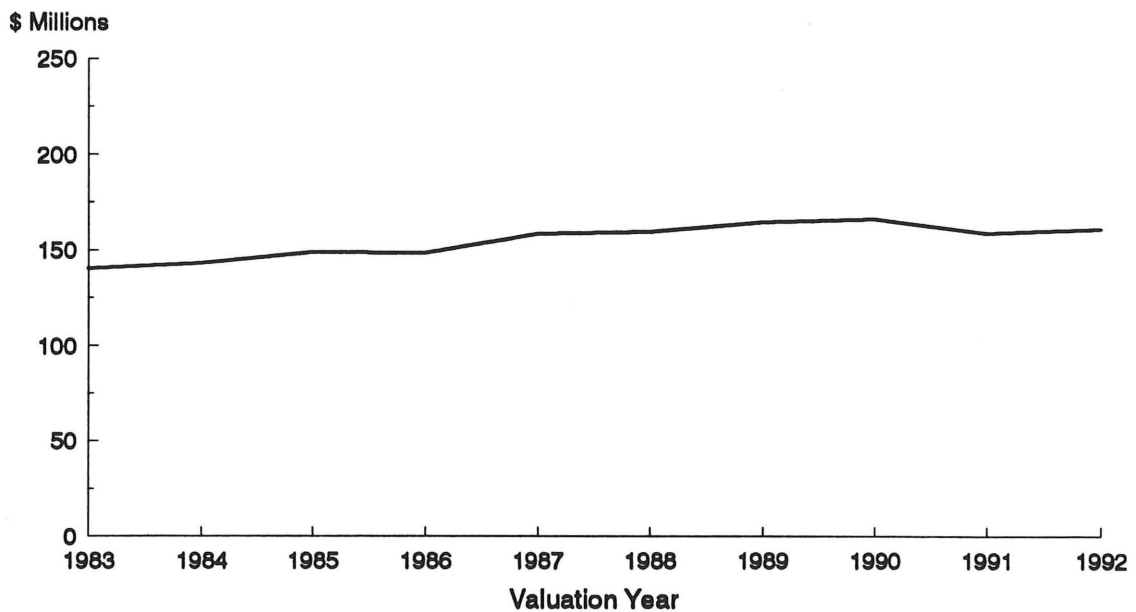
# St. Paul Police Relief Association

## Comparative Schedule

### Of Active Members

Valuation Date December 31	Active Members	Valuation Payroll	Average			
			Age	Service	Pay	% Incr.
1983	480	\$14,065,920	40.3 yrs.	14.7 yrs.	\$29,304	6.0%
1984	467	14,335,032	41.2	15.5	30,696	4.8
1985	464	14,881,408	42.0	16.4	32,072	4.5
1986	443	14,847,145	42.6	17.0	33,515	4.5
1987	435	15,863,580	43.4	17.8	36,468	8.8
1988	419	15,967,671	44.0	18.4	38,109	4.5
1989	394	16,467,230	44.6	19.1	41,795	9.7
1990	376	16,635,368	45.0	19.7	44,243	5.9
1991	359	15,883,237	45.5	20.1	44,243	0.0
1992	352	16,118,784	46.3	21.0	45,792	3.5

### Valuation Payroll



St. Paul Police Relief Association

Brief Summary (12/31/92) of Benefit Provisions Evaluated and/or Considered

---

Age & Service Retirement

Eligibility. 20 years of service and 50 years of age.

Amount. For first 20 years of service, 40/100 of base pay. For each year in excess of 20, an additional 2/100 is added to a maximum of 50/100 of base pay for 25 or more years of service. For each year over 25, an additional 1/2% of base pay is added to the benefit. (The latter additional benefit is not subject to the post-retirement adjustment provisions.)

Pay Used for Plan Purposes. "Base pay" means the salary of patrolman.

Disability Retirement

Eligibility. Permanently disabled to the extent that no longer able to perform the duties of a police officer before being eligible for regular retirement.

Amount.

Duty Disability. 40/100 of base pay.

Non-Duty Disability. 5 years of service required. For first 5 years, 10/100 of base pay. For each year in excess of 5, an additional 2/100 is added up to a maximum of 40/100 of 20 years of service.

For either duty or non-duty, the benefit will be recomputed at age 50 if actual service would result in a benefit greater than 40/100 of base pay.

Member's Death While Active, Or In Deferred Status, Or Retired

Eligibility.

Spouse. Legally married to member at least one year at time of separation from service and residing with member at time of death. Benefits terminate upon remarriage, but may be reinstated if the remarriage terminates for any reason.

Child. Younger than 18 or, if full-time student, younger than 23.

Amount.

Spouse. 27.50/100 of base pay.

Child. 5/100 of base pay.

Vested Deferred. Separated before age 50. Payment beginning is deferred to attainment of age 50. For members terminating with less than 20 years of service, the deferred benefit is based on 1.25/100 of base pay per year of service. Potential surviving spouse benefit is based on 0.85/100 of base pay per year of service. Potential surviving unmarried child (younger than 18 or 23, if a full-time student) benefit is based on .156/100 of base pay per year of service.

Post-Retirement Adjustments ("Escalator"). Each time base pay is changed, payments to all benefit recipients are simultaneously changed by the same percent that base pay is changed.

Member Contributions. 8% of base pay. Non-refundable.

## **Section C**

### **Valuation Methods and Assumptions**



# St. Paul Police Relief Association

## Valuation Methods and Assumptions

The Entry Age Normal Cost method was used to determine the normal cost of all benefits. The rate of investment return (interest) as required by state law used in making the valuation was 5.0 percent per annum, compounded annually. Age & service retirement was assumed to occur at age 58, or attained age if older.

### Mortality Table\*

Sample Ages	Single Life Values: Present Value of \$1 Monthly				Future Life Expectancy (Years)	
	Level		Increasing			
	For Life		3.5% Yearly		Men	Women
	Men	Women	Men	Women		
45	\$177.21	\$189.58	\$280.82	\$314.75	29.50	34.00
50	163.12	177.21	246.55	280.82	25.20	29.50
55	147.50	163.12	212.60	246.55	21.16	25.20
60	130.52	147.50	179.49	212.60	17.42	21.16
65	112.87	130.52	148.28	179.49	14.05	17.42
70	95.20	112.87	119.70	148.28	11.09	14.05
75	77.77	95.20	93.83	119.70	8.52	11.09
80	61.71	77.77	71.69	93.83	6.39	8.52

\* UP-1984 Table set forward 2 years for males and set back 3 years for females.

### Sample Rates of Separation from Active Employment Before Retirement, Death or Disability

Sample Ages	% of Active Members Separating within Next Year
20	6.00%
25	5.00
30	4.00
35	3.00
40	2.00
45	1.00
50+	0.00

Pay Adjustment Factor Used To Project Current Pays

<u>Sample Ages</u>	<u>Present Pay Resulting in Pay of \$1,000 at Age 60</u>	<u>Present Increase in Pay During Next Year</u>
20	\$ 253	3.5%
25	300	3.5
30	356	3.5
35	423	3.5
40	503	3.5
45	597	3.5
50	709	3.5
55	842	3.5
60	1,000	3.5

Use of the pay adjustment factor illustrated above is required by state law.

Anticipated Disability Retirements

<u>Sample Ages</u>	<u>% of Active Members Becoming Disabled within Next Year</u>
20	0.08%
25	0.08
30	0.08
35	0.08
40	0.20
45	0.26
50	0.49
55	0.89

## **Section D**

### **The Pension Benefit Obligation and Certain Other Disclosures Required by Statement No. 5 of the Governmental Accounting Standards Board**

## PENSION BENEFIT OBLIGATION

---

The amount shown below as the "pension benefit obligation" is a standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future as a result of employee service to date. The measure is the actuarial present value of credited projected benefits and is intended to (i) help users assess the plan's funding status on a going-concern basis, (ii) assess progress being made in accumulating sufficient assets to pay benefits when due, and (iii) allow for comparisons among public employee retirement plans. The measure is independent of the actuarial funding method used to determine contributions to the plan.

The pension benefit obligation was determined as part of an actuarial valuation of the plan as of December 31, 1992. Significant actuarial assumptions used in determining the pension benefit obligation include (a) a rate of return on the investment of present and future assets of 5.0% per year compounded annually, (b) projected salary increases of 3.5% per year compounded annually, attributable to inflation, and (c) the assumption that benefits will increase 3.5% per year after retirement.

At December 31, 1992, the unfunded pension benefit obligation was \$50,886,839, determined as follows:

### Pension Benefit Obligation:

Retirants and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$109,501,284
Current employees --	
Accumulated employee contributions including allocated investment income	0
Employer financed	<u>86,211,206</u>
Total Pension Benefit Obligation	\$195,712,490
Net assets available for benefits, at cost (market value was \$162,221,518)	<u>144,825,651</u>
Unfunded Pension Benefit Obligation	\$ 50,886,839

The total pension benefit obligation as of January 1, 1992 was \$188,275,207. During the year, the plan experienced a net change of \$7,437,283 in the pension benefit obligation.

## CONTRIBUTIONS REQUIRED AND CONTRIBUTIONS MADE

The Association's funding policy provides for periodic employer contributions at actuarially determined rates that, expressed as percentages of annual covered payroll, are designed to accumulate sufficient assets to pay benefits when due. The normal cost and actuarial accrued liability are determined using an entry age actuarial funding method. Unfunded actuarial accrued liabilities are being amortized as a level dollar amount over a period of 17 years.

During the year ended December 31, 1992, contributions totaling \$10,405,612 -- \$9,148,103 employer and \$1,257,509 employee -- were made in accordance with contribution requirements determined by an actuarial valuation of the plan as of December 31, 1990. The employer contributions consisted of \$2,433,754 for normal cost and \$6,714,349 for amortization of the unfunded actuarial accrued liability. Employer contributions represented 54.99% of covered payroll.

Significant actuarial assumptions used to compute contribution requirements were the same as those used to compute the standardized measure of the pension benefit obligation.

### Computed Contribution Comparative Schedule

Fiscal Year <u>December 31</u>	Valuation Date <u>December 31</u>	<u>Contribution Rates</u>		Valuation <u>Payroll</u>	<u>Dollar Contribution For Fiscal Year</u>	
		<u>Normal Cost % of Valuation Payroll</u>	<u>UAAL Dollars</u>		<u>Computed</u>	<u>Actual</u>
1987	1985	14.34%	\$4,339,786	\$14,881,408	\$6,473,780	\$7,040,707
1988	1986	14.31	4,188,901	14,847,145	6,313,527	6,891,184
1989	1987	14.26	4,740,907	15,863,580	7,003,054	7,118,163
1990	1988	14.27	4,471,859	15,967,671	6,750,446	6,887,250
1991	1989#	15.70	5,148,028	16,467,230	7,733,383	8,307,863
1992	1990	14.63	6,257,272	16,635,368	8,691,026	9,148,103
1993	1991	14.68	4,044,957	15,883,237	6,376,616	
1994	1992	14.64	4,520,937	16,118,784	6,880,727	

# After change in benefit provisions.



# REQUIRED SUPPLEMENTARY INFORMATION

## ANALYSIS OF FUNDING PROGRESS

Valuation Date December 31	(1) Net Assets Available for Benefits	(2) Pension Benefit Obligation (PBO)	(3) Percent Funded (1)/(2)	(4) Unfunded PBO (2)-(1)	(5) Annual Covered Payroll	(6) Unfunded PBO as a Percentage of Covered Payroll (4)/(5)
1987	\$ 80,866,662	\$139,530,164	58.0%	\$58,663,502	\$15,863,580	369.8%
1988	92,597,769	145,887,709	63.5	53,289,940	15,967,671	333.7
1989	116,547,392	176,714,962	66.0	60,167,570	16,467,230	365.4
1990	118,436,618	188,431,931	62.9	69,995,313	16,635,368	420.8
1991	147,020,448	188,275,207	78.1	41,254,759	15,883,237	259.7
1992	144,825,651	195,712,490	74.0	50,886,839	16,118,784	315.7

Analysis of the dollar amounts of net assets available for benefits, pension benefit obligation, and unfunded pension benefit obligation in isolation can be misleading. Expressing the net assets available for benefits as a percentage of the pension benefit obligation provides one indication of the plan's funded status on a going-concern basis. Analysis of this percentage over time indicates whether the system is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan. The unfunded pension benefit obligation and annual covered payroll are both affected by inflation. Expressing the unfunded pension benefit obligation as a percentage of annual covered payroll approximately adjusts for the effects of inflation and aids analysis of the progress being made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the plan.

## **Appendices**

## APPENDIX I

### FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES

---

Promises Made, and Eventually Paid. As each year is completed, the plan in effect hands an "IOU" to each member then acquiring a year of service credit -- the "IOU" says: "The Pension Plan owes you a portion of your retirement benefits, payments to be made in cash, commencing when you qualify for retirement."

The related key financial questions are: Which generation of taxpayers contributes the money to cover the IOU? The present taxpayers, who receive the benefit of the member's present year of service? Or the future taxpayers, who happen to be in town paying taxes at the later time when the IOU becomes a cash demand?

A sound principle of sound retirement plan financing is to have this year's taxpayers contribute the money to cover the IOUs being handed out this year. By following this principle, THE CONTRIBUTION RATE WILL REMAIN APPROXIMATELY LEVEL FROM GENERATION TO GENERATION -- our children and grandchildren will contribute the same percents of active payroll we contribute now.

### A PENSION PLAN BECOMES CLOSED

The diagram in this appendix shows two important activities which occur after a plan has been closed to employees hired in the future.

Cash benefits paid continue to increase for decades, while active member payroll begins to decrease to zero.

Funding Method. A funding method is the long-term, planned pattern for employer contributions.

For an open plan (a plan covering future employees), the level-percent-of-active-member payroll funding method is the basic funding method.

The level-percent funding method can also be applied to a closed plan. However, the resulting contribution percent usually jumps to a high rate, because the number of covered active members is decreasing.

A preferred funding method for a closed plan consists of: level-percent funding for normal cost (the cost of members' service now being rendered); plus a level dollar contribution for unfunded actuarial accrued liabilities over a limited period of years. The period of years must be limited so that plan assets don't become zero while benefits are still payable.

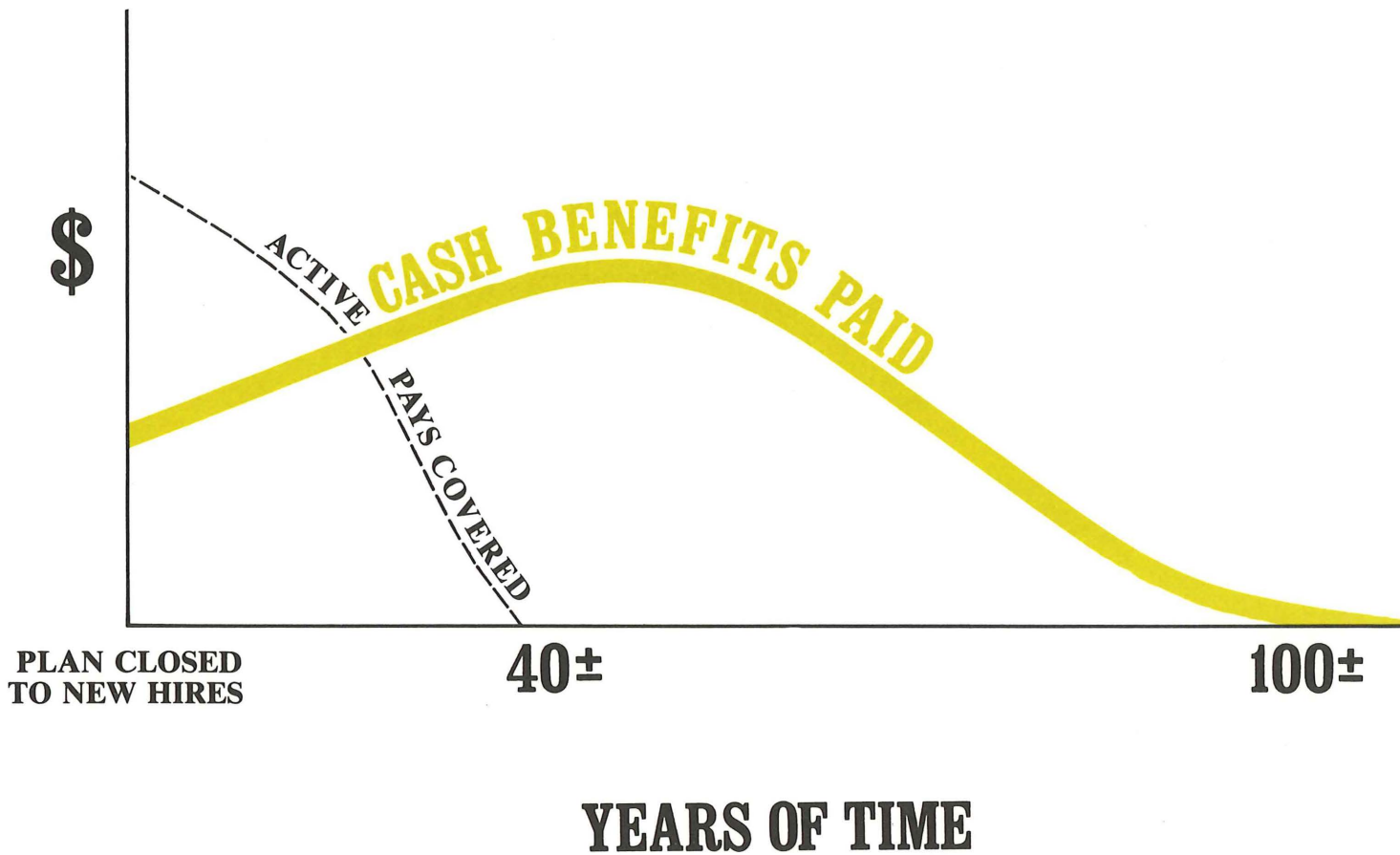
Computing Contributions To Support Plan Benefits. From a given schedule of benefits and from the employee data and asset data furnished him, the actuary determines the contribution rates to support the benefits by means of an actuarial valuation and a funding method.

In making an actuarial valuation, assumptions must be made regarding anticipated financial experiences for the next year and for decades in the future. Only the subsequent actual experience of the plan can indicate the degree of accuracy of the assumptions.

Reconciling Differences Between Assumed Experience and Actual Experience. Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the wisdom of the assumptions or the skill of the actuary and the millions of calculations he made. The future can be predicted with considerable but not 100% precision, except for inflation which seems to defy reliable prediction.

A well-managed plan copes with these continually changing differences by having periodic actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is continuing adjustment in financial position.

# A CLOSED PENSION PLAN



A plan becomes closed when no new hires are admitted to active membership. The persons covered by the plan at the time of closing continue their normal activities and continue to be covered by the plan, until the last survivor dies.

**CASH BENEFITS LINE.** After a pension plan becomes closed, the usual pattern is for cash benefits to continue to increase for decades of time. Eventually the cash benefits will peak, and then gradually decrease over more decades of time, ultimately to zero. The last cash benefit is likely to occur a century after the time the plan is closed.

The precise amounts of cash benefits cannot be known now, and must be estimated by assumptions of future experiences in a variety of financial risk areas.



## APPENDIX II

### MEANING OF UNFUNDED ACCRUED LIABILITIES

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Almost every pension plan (public or private) has "unfunded accrued liabilities", so whatever they are, they aren't rare. Since the term is not part of everyday conversation, it needs some definition.

"Accrued liabilities" are the present value \$ of plan promises to pay benefits in the future based upon service already rendered - - - a liability has been established ("accrued") because the service has been rendered, but the resulting monthly cash benefit may not be payable until years in the future. Accrued liabilities \$ are the result of complex mathematical calculations, which are made by the plan's actuary (which is the name given to the specialist who makes such calculations).

If "accrued liabilities" at any time exceed the plan's accrued assets (cash & investments), the difference is "unfunded accrued liabilities". This is the common condition. If the plan's assets equalled the plan's "accrued liabilities", the plan would be termed "fully funded". This is a rare condition.

Each time a plan adds a new benefit which applies to service already rendered, an "accrued liability" is created, which is also an "unfunded accrued liability" because the plan can't print instant cash to cover the accrued liability. Payment for such unfunded accrued liabilities is spread over a period of years, commonly in the 20-40 year range.

Unfunded accrued liabilities can occur in another way: If actual financial experience is less favorable than assumed financial experience, the difference is added to unfunded accrued liabilities. In plans where plan benefits are directly related to an employee's pay near time of retirement (a common plan provision) rather than his average pay throughout his working career, unfunded accrued liabilities have been increasing in recent years because unexpected rates of pay increase have created additional accrued liabilities which could not be matched by reasonable investment results. Some of these unexpected pay increases are the direct result of inflation, which is a very destructive force on financial stability.

The existence of unfunded accrued liabilities is not bad (any more than a mortgage on your house is "bad"), but the changes from year to year in amount of unfunded accrued liabilities are important - - - "bad" or "good" or somewhere in between.

Nor are unfunded accrued liabilities a bill payable immediately (your food costs are payable immediately), but it is important that policy-makers prevent the amount from becoming unreasonably high and it is vital that your plan have a sound method for making payments toward them so that they are controlled.

The existence of large amounts of unfunded accrued liabilities indicates that total contributions in past years were less than level - - - an almost certain history if retired life liabilities are not fully funded now.