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Minneapolis Police Relief Association

Annual Actuarial Valuation

December 31, 1989

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Appendix I Financial Principles and Operational Techniques

Appendix II Meaning of Unfunded Accrued Liabilities

June 8, 1990

Board of Trustees
Minneapolis Police Relief Association
Minneapolis, Minnesota

Submitted in this report are the results of the December 31, 1989 actuarial valuation of the assets, actuarial values and contribution requirements associated with the benefits provided by the Minneapolis 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, 1991. 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.

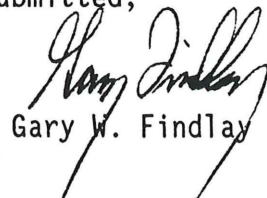
A description of the actuarial funding method and the risk experience assumptions used is contained in Section C. The economic risk experience assumptions, as well as the actuarial funding method to be used, are established by state law.

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 6% annual investment return and 4% 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.

Minneapolis Police Relief Association

CONTRIBUTION RATE TO PROVIDE BENEFITS

Member portion & Employer portion
Effective January 1, 1991

<u>Contributions for</u>	<u>If Paid Equally Throughout Year</u>	
	<u>Normal Cost</u> <u>% of Active</u> <u>Payroll for 1991</u>	<u>UAAL Dollars</u>
Normal cost of annuities:		
Age & service: to members	18.74%	
Age & service: to survivors	2.81	
Disability	1.64	
Death before retirement	1.34	
Refunds of member contributions	0.00	
Total Normal Cost	24.53%	

Amortization of unfunded actuarial
accrued liabilities (UAAL)
(20 year level dollar payment)

Retired lives	\$ 0
Active members	6,727,495
Total	6,727,495

Total Cost of Benefits	24.53%	+	\$6,727,495
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Member contributions	8.00%
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COMPUTED EMPLOYER RATE:

(a) If Paid Equally Throughout Year	16.53%	+	\$6,727,495
(b) IF PAID AS OUTLINED BELOW	16.94%	+	\$6,893,631

The amounts in (b) were computed to adjust for interest according to the following payment pattern:

1. The state amortization aid of \$934,254 is received in 4 equal installments on 3/15, 7/15, 9/15 and 11/15.
2. The balance of the contribution is received as follows:
 - a. 16.0% of the balance is received from the State on 10/15.
 - b. 35.1% of the balance is received from the City on 7/5 and 12/5.
 - c. 2.3% of the balance is received from the City on 7/15, 8/15, 9/15, 10/15, 11/15 and 12/15.

Minneapolis Police Relief Association
Present Actuarial Condition

The actuarial value of the Association's assets (valuation assets) were in excess of \$211 million on December 31, 1989 -- 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 \$211 million into perspective by showing the relationship between valuation assets, actuarial accrued liabilities, and the number of persons with actual and potential claims on the Association's assets.

	<u>Valuation Assets</u>	<u>Actuarial Accrued Liabilities</u>	<u>Unfunded Actuarial Accrued Liabilities</u>	<u>% Funded</u>
Retirants and Beneficiaries				
Retired Members (524)		\$142,703,436		
Surviving Spouses (213)		20,370,252		
Surviving Children (15)		<u>162,636</u>		
Total (752)		\$163,236,324		
Deferred Members (16)		4,539,024		
Active Members (460)	<u> </u>	<u>122,762,249</u>	<u> </u>	
Total	\$211,081,322	\$290,537,597	\$79,456,275	72.7%

Actuarial accrued liabilities represent the value, computed as of December 31, 1989 of:

- (i) retirement allowances likely to be paid the 752 retirants and beneficiaries; and
- (ii) the contributions assumed to have been made for the 460 active members from entry into the plan until December 31, 1989.

The value of retirement allowances likely to be paid the 752 retirants and beneficiaries, discounted for investment earnings and mortality, was computed to be \$163,236,324 as of December 31, 1989. To put this amount in perspective, the \$163,236,324, together with investment earnings, will just be sufficient to pay the 752 retirants and beneficiaries their allowances for their remaining lifetimes. This assumes the 752 retirants and beneficiaries live and die according to the assumed mortality and the \$163,236,324 is invested to yield an average annual return of 6.0% over the remaining lifetimes of the retirants and beneficiaries and the benefit payments increase according to the actuarial assumptions and benefit provisions shown in this report.

With respect to the active members, the actuarial accrued liability of \$122,762,249 represents the amount that would have been accumulated by December 31, 1989. 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, 1989 for the 460 actives, and that these amounts had earned 6.0% interest. It also assumes that the members in the past have lived, died, withdrawn, retired and received salary increases according to the actuarial assumptions and benefit provisions shown in this report.

Historical Funding Ratio Schedule
(\$ in thousands)

<u>Valuation Date December 31</u>	<u>Actuarial Accrued Liabilities</u>	<u>Valuation Assets</u>	<u>% Funded</u>
1980	\$179,399	\$ 37,980	21.2%
1981	200,493	46,721	23.3
1982*	228,109	65,379	28.7
1983	232,890	81,382	34.9
1984*	248,239	94,680	38.1
1985*	264,194	115,069	43.6
1986	272,487	136,075	49.9
1987	288,555	150,307	53.1
1988	299,434	170,005	56.8
1988#	281,439	184,998	65.7
1989	290,537	211,081	72.7

* After change in assumptions.

After change in benefit provisions and assumptions.

Minneapolis Police Relief Association
 Computed Contributions - Comparative Schedule

Year Ended December 31		Total Normal Cost as a Percent of Valuation Payroll*	Contribution For Unfunded Actuarial Accrued Liabilities \$ or %
Valuation	Fiscal		
1980	1982	24.64%	\$ 9,114,128
1981	1983	24.79	10,071,771
1982	1984**	27.40	10,844,206
1983	1985**	28.74	10,631,760
1984	1986**	28.07	10,041,583
1985	1987**	29.66	10,545,734
1986	1988	29.55	9,868,442
1987	1989	29.45	10,026,239
1988	1990	29.32	9,850,745
1988	1990#	24.70	7,961,386
1989	1991	24.53	6,727,495

* Includes employee contributions.

** After change in assumptions.

After change in benefit provisions and assumptions.

Minneapolis Police Relief Association
CONTRIBUTION FOR CALENDAR YEAR EFFECTIVE JANUARY 1, 1991

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:

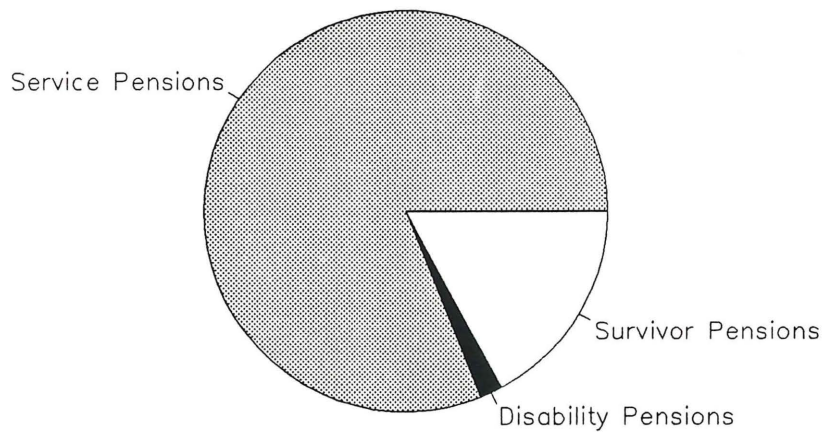
(1)	Estimated covered payroll for 1991		\$ _____
(2)	Total normal cost % from page A-2		24.53%
(3)	Total normal cost (Line 1 times line 2)		\$ _____
(4)	Amortization payment on UAAL from page A-2		6,727,495
(5)	Total contributions required (Line 3 plus line 4 plus line 5)		_____
(6)	Employee contributions (Line 1 times 8%)		\$ _____
(7)	(a) State amortization aid based on 12/31/78 UAAL of \$118,046,510	\$1,008,524*	
	(b) State amortization aid based on 1984 legislation	<u>243,620</u>	
	(c) Total State amortization aid		\$1,252,144
(8)	Estimated insurance premium aid		_____
(9)	Estimated total contributions from other sources (Line 7 plus line 8 plus line 9)		_____
(10)	Employer's Minimum Obligation if payment is made in equal installments throughout the year (Line 6 minus line 10)		\$ _____
(11)	EMPLOYER'S MINIMUM OBLIGATION IF PAYMENT IS MADE AT YEAR END (Line 11 times 1.0137)		\$ _____

* State amortization aid reduced by Fire Relief Association pro-rata share of \$1,520,000 reduction in amortization aid called for by the 13th check legislation. The potential additional reduction which would result from "excess" investment income during 1990 was not considered.

Section B
**Valuation Data
and
Summary of Benefit Provisions**

Minneapolis Police Relief Association
Retirants and Beneficiaries December 31, 1989
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	511	\$ 810,946.15	\$137,525,664
Disability	<u>13</u>	<u>18,791.50</u>	<u>5,177,772</u>
Totals	524	829,737.65	142,703,436
Beneficiaries receiving:			
Spouse	213	167,141.10	20,370,252
Child	<u>15</u>	<u>3,717.00</u>	<u>162,636</u>
Totals	228	170,858.10	20,532,888
Totals	<u>752</u>	<u>\$1,000,595.75</u>	<u>\$163,236,324</u>



Monthly Amount Paid by Benefit

Minneapolis Police Relief Association
Inactive Members Eligible For Deferred Benefits
December 31, 1989

<u>No.</u>	<u>Monthly Amount</u>	<u>Computed Actuarial Accrued Liabilities</u>
16	\$21,624.68	\$4,539,024

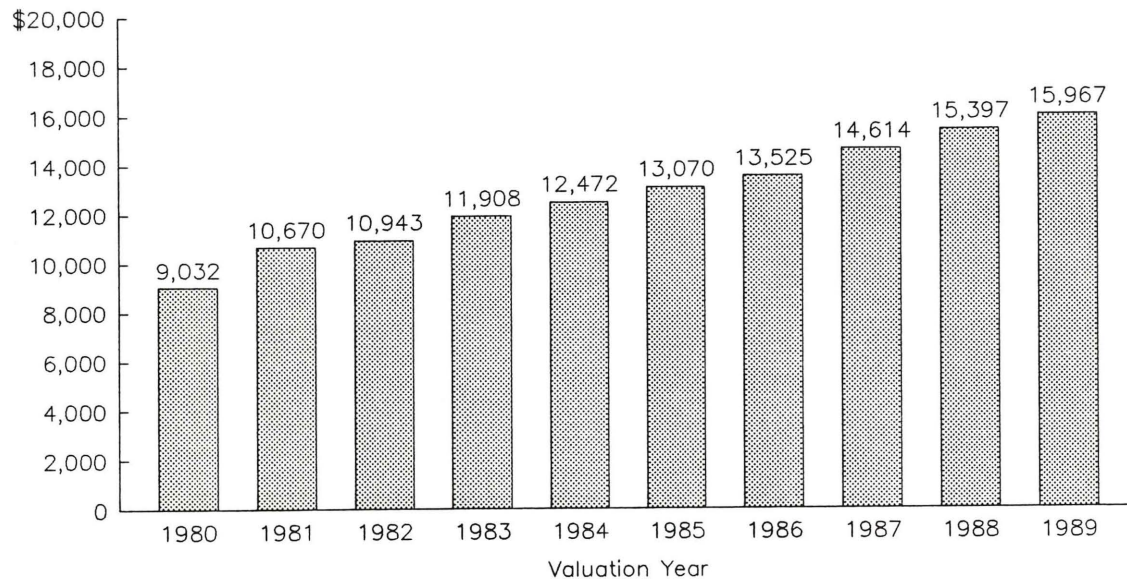
Minneapolis Police Relief Association
Retirants and Beneficiaries December 31, 1989
By Attained Ages

<u>Attained Ages</u>	<u>Number</u>		
	<u>Age & Service</u>	<u>Disability</u>	<u>Death Before Retirement</u>
Under 20		1	11
20-24			3
30-34			1
35-39			1
40-44		3	1
45-49		10	3
50-54	72	1	2
55-59	89		4
60-64	113		6
65-69	100		8
70-74	128		5
75-79	92		4
80-84	47		1
85-89	26		1
90-94	15	1	1
95-99	1		
100 & Over	<u>1</u>	<u>—</u>	<u>—</u>
Totals	684	16	52

Minneapolis 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>
1980	29	72	688	\$ 6,214,153	\$ 94,396,604
1981	59	90	695	7,415,469	100,936,794
1982	30	29	696	7,616,484	117,978,790
1983	36	40	692	8,238,879	119,499,721
1984	35	35	692	8,630,848	122,412,264
1985	36	29	699	9,135,889	129,482,448
1986	35	38	696	9,413,244	132,060,228
1987	60	28	728	10,639,309	151,962,120
1988	45	30	743	11,440,308	155,541,576
1989	40	31	752	12,007,149	163,236,324

Average Annual Allowances



Minneapolis Police Relief Association
Active Members December 31, 1989
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
35-39			20	19				39	\$ 1,561,794
40-44			28	75	57			160	6,407,360
45-49			4	32	79	4		119	4,765,474
50-54			1	13	34	46	1	95	3,804,370
55-59				2	4	22	6	34	1,361,564
60						2	3	5	200,230
62					1		2	3	120,138
63							1	1	40,046
64						1	3	4	160,184
Totals			53	141	175	75	16	460	\$18,421,160

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

Age: 46.6 years.

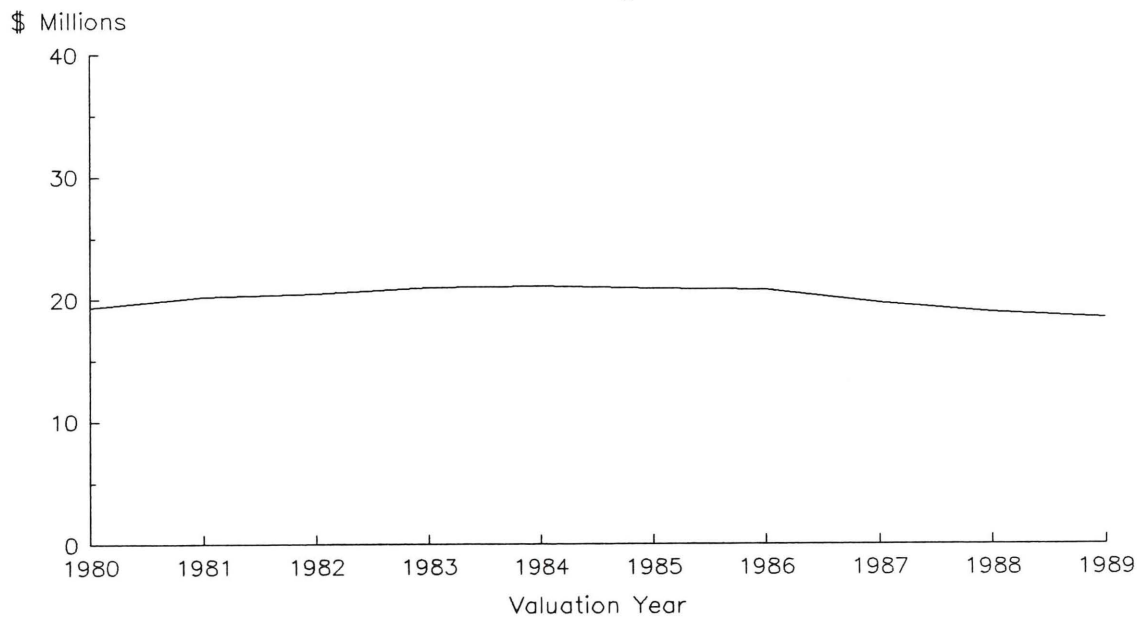
Service: 21.0 years.

Annual Pay: \$40,046.

Minneapolis Police Relief Association
Comparative Schedule
Of Active Members

Valuation Date December 31	Active Members	Valuation Payroll	Average			
			Age	Service	Pay	% Incr.
1980	737	\$19,350,672	41.4 yrs.	15.1 yrs.	\$26,257	8.5%
1981	712	20,218,664	41.9	15.5	28,397	8.2
1982	686	20,474,356	42.5	16.2	29,846	5.1
1983	663	20,979,972	43.2	17.0	31,644	6.0
1984	641	21,079,926	43.9	17.8	32,886	3.9
1985	611	20,890,701	44.5	18.5	34,191	4.0
1986	586	20,737,368	45.2	19.3	35,388	3.5
1987	529	19,634,893	45.4	19.6	37,117	4.9
1988	489	18,876,378	45.9	20.3	38,602	4.0
1989	460	18,421,160	46.6	21.0	40,046	3.7

Valuation Payroll



Minneapolis Police Relief Association

Brief Summary (12/31/89) of Benefit Provisions Evaluated and/or Considered

Age & Service Retirement

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

Amount. For first 19 years of service, 30.40/80 of base pay and 3.60/80 is added for the 20th year of service. For service in excess of 20 years, an additional 1/80 is provided for each of the first 4 years and 4/80 is added for the 25th year to a maximum of 42/80 of base pay for 25 or more years of service. (Members retired prior to 7/80 receive 1/80 of base pay less and those retired prior to 7/69 receive 1/80 of base pay for each year over 20 thru the 28th year.)

Pay Used For Plan Purposes. "Base pay" means the salary of a top grade patrol officer.

Disability Retirement

Eligibility.

Non-duty. No minimum required.

Duty. No minimum service required. (In either case, disabled to the extent that no longer able to perform duties of a police officer including limited duty.)

Amount.

Non-duty. 34/80 of base pay. (Prior to 7/80 non-duty disability benefits ranged from 13/80 to 33/80.)

Duty. 34/80 of base pay. (Prior to 7/80 the amount was 33/80.)

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

Eligibility.

Spouse. Legally married to member one year prior to separation from service and residing with member at time of death. Benefits terminate upon remarriage.

Child. Younger than age 18 or, if in school, younger than age 22.

Amount.

Spouse. 19/80 of base pay.

Child. 6/80 of base pay per child. Children's maximum is 14/80 if spouse is receiving or 33/80 if no spouse is receiving.

Vested Deferred. 5 years of service. Payment beginning is deferred to attainment of age 50.

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. Member contributions are non-refundable. If a member terminates after 5 years of service but before being eligible for an immediate or deferred benefit, a lump sum refund of \$500 plus \$100 for each full year over 5 is paid.

Minneapolis Police Relief Association

Derivation of Valuation Assets

Valuation Date December 31	(a) Market Value	(b) Book Value	(c) Market- Book
1987	\$165,214,243	\$146,192,870	\$19,021,373
1988	184,436,109	166,562,355	17,873,754
1989	215,690,660	193,586,986	22,103,674
(d) Average Unrealized Gain			\$19,666,267
(e) Excess Investment Income*			2,171,931
(f) Assets 12/31/89 (Book Value 12/31/89 + (d) - (e))			<u>\$211,081,322</u>

* Excess investment income was reported by Minneapolis Police Relief Association to be \$2,171,931.

Section C

Valuation Methods and Assumptions

Minneapolis 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 6.0 percent per annum, compounded annually. Age & service retirement was assumed to occur at age 54, attained age if older.

Mortality Table*

Sample Ages	Single Life Values: Present Value of \$1 Monthly				Future Life Expectancy (Years)	
	Level		Increasing			
	For Life		4.0% Yearly			
	Men	Women	Men	Women	Men	Women
45	\$159.22	\$168.84	\$261.90	\$291.24	29.50	34.00
50	147.95	159.22	231.75	261.90	25.20	29.50
55	135.09	147.95	201.37	231.75	21.16	25.20
60	120.76	135.09	171.29	201.37	17.42	21.16
65	105.49	120.76	142.51	171.29	14.05	17.42
70	89.88	105.49	115.81	142.51	11.09	14.05
75	74.14	89.88	91.34	115.81	8.52	11.09
80	59.37	74.14	70.19	91.34	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	\$ 208	4.0%
25	253	4.0
30	308	4.0
35	375	4.0
40	456	4.0
45	555	4.0
50	676	4.0
55	822	4.0
60	1,000	4.0

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, 1989. 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 6.0% per year compounded annually, (b) projected salary increases of 4.0% per year compounded annually, attributable to inflation, and (c) the assumption that benefits will increase 4.0% per year after retirement.

At December 31, 1989, the unfunded pension benefit obligation was \$88,676,643 determined as follows:

Pension Benefit Obligation:

Retirants and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$167,775,348
Current employees --	
Accumulated employee contributions including allocated investment income	0
Employer financed	<u>114,488,281</u>
Total Pension Benefit Obligation	\$282,263,629
Net assets available for benefits, at cost (market value was \$215,690,660)	<u>193,586,986</u>
Unfunded Pension Benefit Obligation	\$ 88,676,643

The total pension benefit obligation as of January 1, 1989 was \$272,696,589. During the year, the plan experienced a net change of \$9,567,040 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 20 years.

During the year ended December 31, 1989 contributions totaling \$13,923,604 -- \$12,479,453 employer and \$1,444,151 employee -- were made in accordance with contribution requirements determined by an actuarial valuation of the plan as of December 31, 1987. The employer contributions consisted of \$4,211,685 for normal cost and \$8,267,768 for amortization of the unfunded actuarial accrued liability. Employer contributions represented 63.56% 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 December 31	Valuation Date December 31	<u>Contribution Rates</u>		Valuation Payroll	<u>Dollar Contribution For Fiscal Year</u>	
		Normal Cost % of Valuation Payroll	UAAL Dollars		Computed	Actual
1987	1985	21.66%	\$10,545,734	\$20,890,701	\$15,070,660	\$16,054,466
1988	1986	21.55	9,868,442	20,737,368	14,337,345	14,557,987
1989	1987	21.45	10,026,239	19,634,893	14,237,924	12,479,453
1990*	1988	16.70	7,961,386	18,876,378	11,113,741	
1991	1989	16.53	6,727,495	18,421,160	9,772,513	

* After changes in benefit provisions and actuarial assumptions.

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	\$146,452,205	\$281,282,879	52.1%	\$134,830,674	\$19,634,893	686.7%
1988	167,440,802	272,696,589	61.4	105,255,787	18,876,378	557.6
1989	193,586,986	282,263,629	68.6	88,676,643	18,421,160	481.4

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.

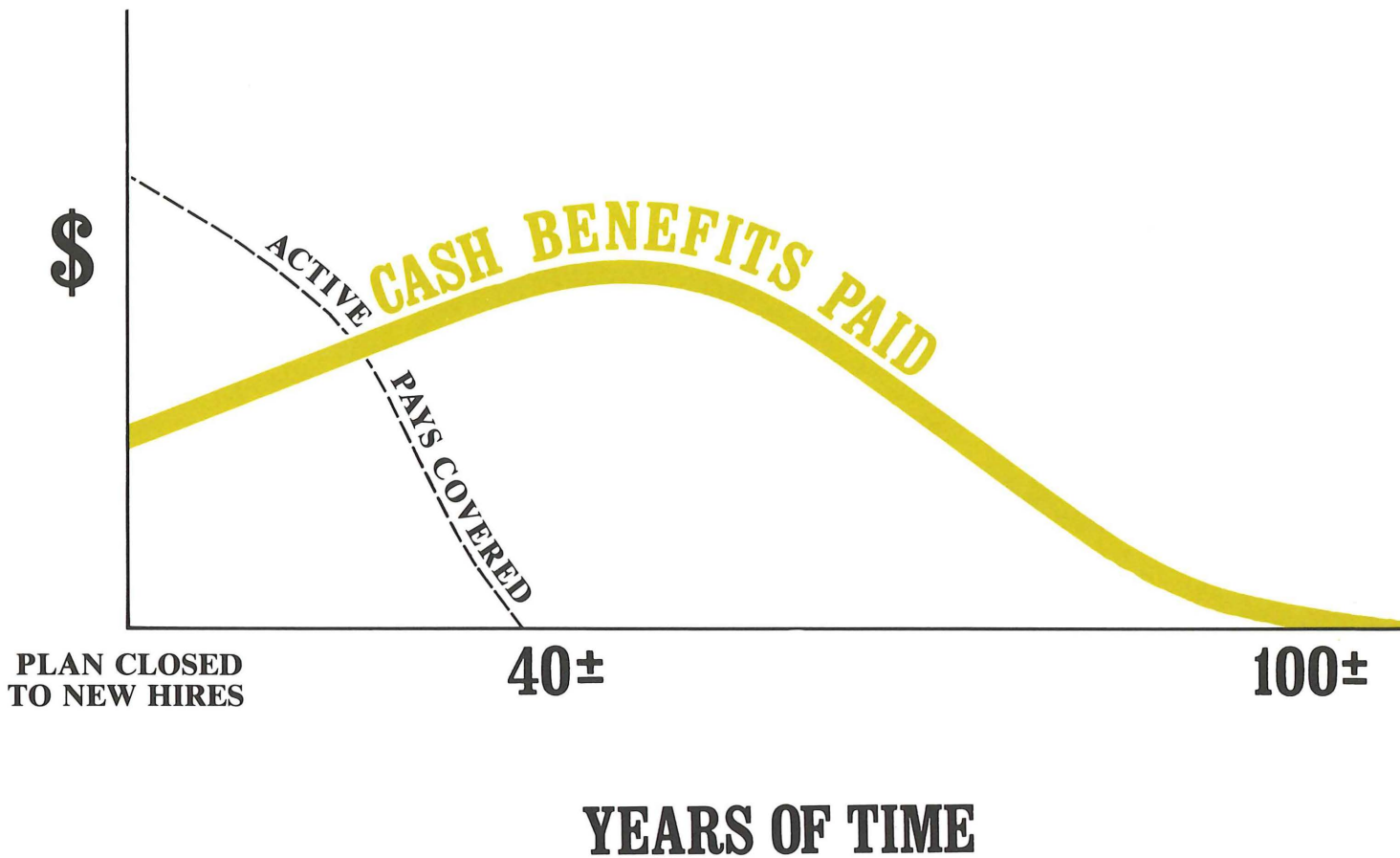
Computing Contributions To Support Plan Benefits. From a given schedule of benefits and from the employee data and asset data furnished him, the actuary determines the contribution rates to support the benefits by means of an actuarial valuation and a funding method.

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

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, then (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.