Minneapolis Fire Department Relief Association

Annual Actuarial Valuation

December 31, 1992

Gabriel, Roeder, Smith & Company
Actuaries and Consultants

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GABRIEL, ROEDER, SMITH & COMPANY
Actuaries & Consultants

1000 Town Center • Suite 1000 • Southfield, Michigan 48075 • 313-799-9000

March 31, 1993

Board of Trustees
Minneapolis Fire Department Relief Association
Minneapolis, 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 Minneapolis Fire Department 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

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.

Changes in Benefit Provisions.

The December 31, 1992 actuarial valuation reflects the following changes in benefit provisions:

1) one additional unit to members with 40/80 of base pay who retired prior to June 15, 1980 with 25 years of service or on a first class disability.

2) one additional unit to members retired prior to 1971 with 25-28 years of service for each of the first four years in excess of 24 years.

3) one additional unit to current and future surviving spouses.

The effects of the changes in benefit provisions were an increase in the normal cost of 0.08% of payroll, an increase in the amortization payment of $258,342 and an increase in the unfunded actuarial accrued liability of $2,787,128.

Minneapolis Fire Department Relief Association

CONTRIBUTION RATE TO PROVIDE BENEFITS

Member portion & Employer portion
Effective January 1, 1994

Contributions for	If Paid Equally Throughout Year: Normal Cost % of Active Payroll for 1994	+	UAAL Dollars
Normal cost of annuities:			
Age & service: to members	16.57%		
Age & service: to survivors	3.00		
Disability	2.51		
Death before retirement	1.82		
Refunds of member contributions	0.00		
Total Normal Cost	23.90%		
Amortization of unfunded actuarial accrued liabilities (UAAL) (17 year level dollar payment)			
Retired lives			$ 0
Active members			5,123,898
Total			5,123,898
Total Cost of Benefits	23.90%	+	$5,123,898
Member contributions	8.00%		
COMPUTED EMPLOYER RATE:			
(a) If Paid Equally Throughout Year	15.90%	+	$5,123,898
(b) IF PAID AT CALENDAR YEAR END	16.12%	+	$5,194,095

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

1. The state amortization aid 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 Fire Department Relief Association

Present Actuarial Condition

The actuarial value of the Association's assets (valuation assets) were in excess of $156.2 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 $156.2 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.

	Valuation Assets	Actuarial Accrued Liabilities	Unfunded Actuarial Accrued Liabilities	% Funded
Retirants and Beneficiaries				
Retired Members (370)		$103,303,668		
Surviving Spouses (188)		22,219,752		
Surviving Children (6)		185,040		
Total (564)		$125,708,460		
Deferred Members (3)		827,988		
Active Members (309)		85,021,755		
Total	$156,278,904	$211,558,203	$55,279,299	73.9%

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

(i) retirement allowances likely to be paid the 564 retirants and beneficiaries; and

(ii) the contributions assumed to have been made for the 309 active members from entry into the plan until December 31, 1992.

The value of retirement allowances likely to be paid the 564 retirants and beneficiaries, discounted for investment earnings and mortality, was computed to be $125,708,460 as of December 31, 1992. To put this amount in perspective, the $125,708,460, together with investment earnings, will just be sufficient to pay the 564 retirants and beneficiaries their allowances for their remaining lifetimes. This assumes the 564 retirants and beneficiaries live and die according to the assumed mortality and the $125,708,460 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 $85,021,755 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 309 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)

Valuation Date December 31	Actuarial Accrued Liabilities	Valuation Assets	% Funded
1983*	$165,956	$ 38,939	23.5%
1984	171,333	42,973	25.1
1985*	181,514	55,568	30.6
1986	186,650	67,315	36.1
1987	193,023	80,911	41.9
1988*#	188,014	93,601	49.8
1989	192,264	110,092	57.3
1990#	196,491	119,652	60.9
1991	201,461	139,891	69.4
1992	208,771	156,279	74.9
1992#	211,558	156,279	73.9

* After change in actuarial assumptions.
\# After change in benefit provisions.

Minneapolis Fire Department Relief Association

Computed Contributions - Comparative Schedule

Year Ended December 31 Valuation	Fiscal	Total Normal Cost as a Percent of Valuation Payroll*	Contribution For Unfunded Actuarial Accrued Liabilities
1983	1985	24.41%	$7,838,161
1984	1986	26.75	8,887,100
1985	1987**	27.28	8,906,560
1986	1988	27.23	8,633,067
1987	1989	27.19	8,311,114
1988	1990**#	23.37	7,793,970
1989	1991	23.33	6,957,374
1990	1992#	23.95	6,687,685
1991	1993	23.85	5,538,556
1992	1994	23.82	4,865,556
1992	1994#	23.90	5,123,898

* Includes employee contributions.

** After change in actuarial assumptions.

\# After change in benefit provisions.

Minneapolis Fire Department 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 total covered payroll for 1994		$________	
(2)	Employer normal cost % from page A-2		15.90%	
(3)	Employer normal cost $ (Line 1 times line 2)			$________
(4)	Amortization payment on UAAL from page A-2			5,123,898
(5)	Total employer contributions required (Line 3 plus line 4)			________
(6)	(a) State amortization aid based on 12/31/78 UAAL of $98,227,435	$_______		
	(b) State amortization aid based on 1984 legislation	203,799		
	(c) Total State amortization aid		________	
(7)	Estimated insurance premium aid		________	
(8)	Estimated total contributions from other sources (Line 6 plus line 7)			________
(9)	Employer's Minimum Obligation if payment is made in equal installments throughout the year (Line 5 minus line 8)			$________
(10)	EMPLOYER'S MINIMUM OBLIGATION IF PAYMENT IS MADE AT YEAR END (Line 9 times 1.0137)			$________

* State amortization aid reduced by Police 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 1993 was not considered.

Section B

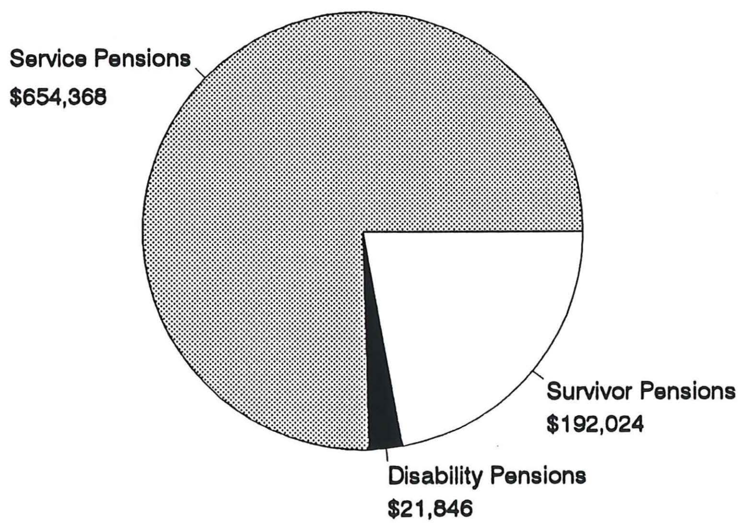
Valuation Data
and
Summary of Benefit Provisions

Minneapolis Fire Department Relief Association

Retirants and Beneficiaries December 31, 1992

By Type of Annuity Being Paid

Type of Annuity Being Paid	No.	Monthly Amounts	Computed Actuarial Accrued Liabilities
Retirants receiving:			
Age & Service	358	$654,368.06	$ 97,472,904
Disability	12	21,845.92	5,830,764
Totals	370	676,213.98	103,303,668
Beneficiaries receiving:			
Spouse	188	189,820.89	22,219,752
Child	6	2,202.95	185,040
Totals	194	192,023.84	22,404,792
Totals	564	$868,237.82	$125,708,460



Monthly Amount Paid by Benefit

Minneapolis Fire Department Relief Association

Retirants and Beneficiaries December 31, 1992

By Attained Ages

Attained Ages	Number: Age & Service	Number: Disability	Number: Death Before Retirement
Under 20			6
40-44		3	2
45-49		6	3
50-54	9	4	3
55-59	36	1	6
60-64	80	1	4
65-69	107	3	4
70-74	58	3	1
75-79	100	14	10
80-84	45	12	3
85-89	19	5	1
90-94	7	2	
95-99	3	1	
100 & over	2		
Totals	466	55	43

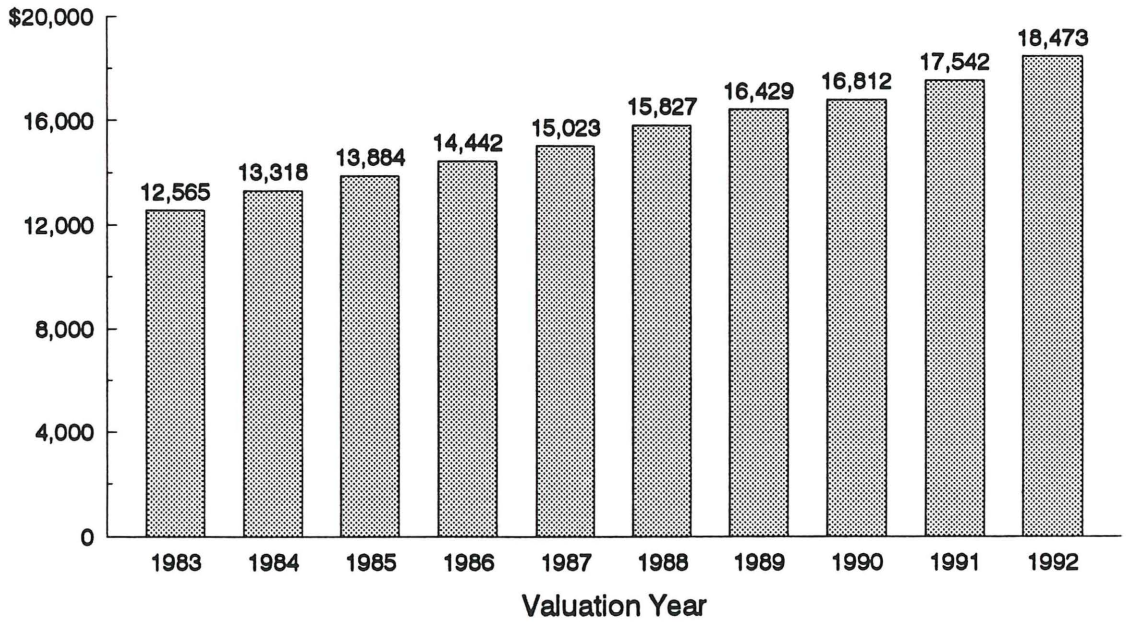
Minneapolis Fire Department Relief Association

Retirants and Beneficiaries Added to and Removed from Rolls

Comparative Statement

Valuation Date December 31	No. Added to Rolls	No. Removed from Rolls	Rolls End of Year No.	Rolls End of Year Annual Allowances	Discounted Value of Total Allowances
1983	35	34	558	$7,011,344	$ 98,013,148
1984	27	37	548	7,298,189	99,824,604
1985	35	28	555	7,705,364	104,997,624
1986	25	21	559	8,072,888	108,457,752
1987	25	29	555	8,337,959	110,331,396
1988	32	25	562	8,894,721	111,904,800
1989	18	25	555	9,118,089	113,227,692
1990	24	22	557	9,364,461	115,174,188
1991	19	22	554	9,717,991	117,998,856
1992	34	24	564	10,418,854	125,708,460

Average Annual Allowances



Minneapolis Fire Department Relief Association

Active Members December 31, 1992

By Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date 0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals No.	Valuation Payroll
30-34			1					1	$ 44,059
35-39			12	2				14	616,826
40-44			19	36	8			63	2,775,717
45-49			8	38	41	7		94	4,141,546
50-54				11	29	35		75	3,304,425
55-59					3	17	8	28	1,233,652
60						4	11	15	660,885
61						1	4	5	220,295
62						1	6	7	308,413
63							2	2	88,118
64						1	2	3	132,177
65							1	1	44,059
70 & Over			—	—	—	—	1	1	44,059
Totals			40	87	81	66	35	309	$13,614,231

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

Age: 49.2 years.

Service: 22.2 years.

Annual Pay: $44,059.

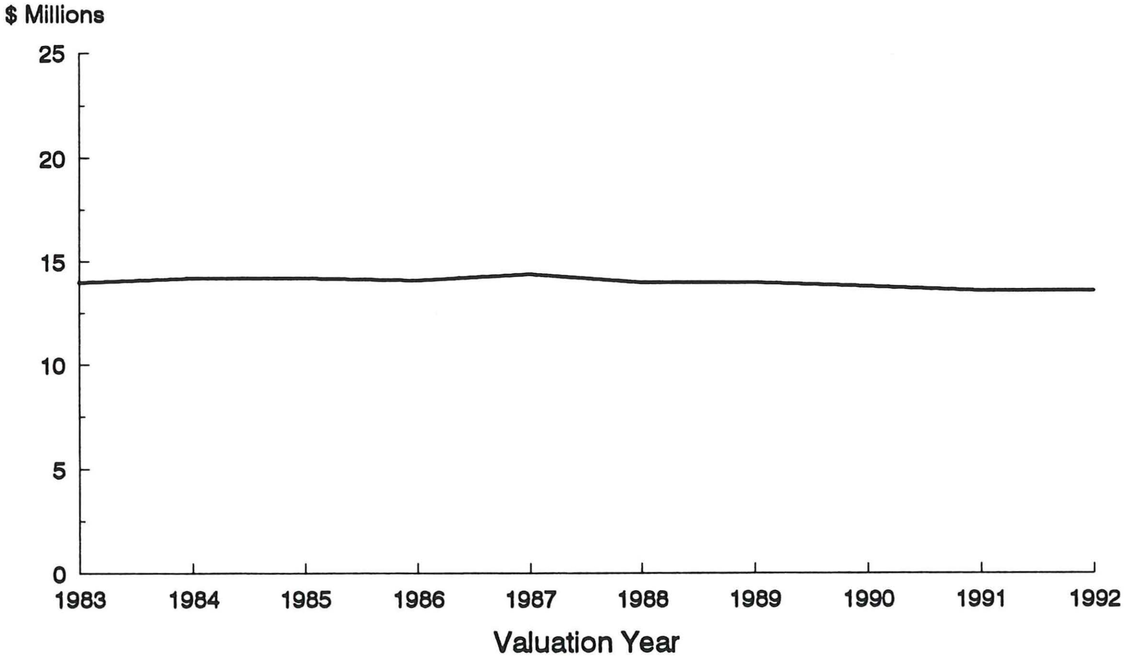
Minneapolis Fire Department Relief Association

Comparative Schedule

Of Active Members

Valuation Date December 31	Active Members	Valuation Payroll	Average Age	Average Service	Average Pay	Average % Incr.
1983	451	$14,042,787	44.0 yrs.	16.2 yrs.	$31,137	4.3%
1984	438	14,278,362	44.6	16.9	32,599	4.7
1985	418	14,291,838	45.3	17.7	34,191	4.9
1986	401	14,190,588	45.8	18.3	35,388	3.5
1987	389	14,431,511	46.5	19.0	37,099	4.8
1988	364	14,045,668	46.7	19.4	38,587	4.0
1989	351	14,067,027	47.4	20.0	40,077	3.9
1990	337	13,854,744	48.0	20.8	41,112	2.6
1991	321	13,664,649	48.6	21.5	42,569	3.5
1992	309	13,614,231	49.2	22.2	44,059	3.5

Valuation Payroll



Minneapolis Fire Department 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 19 years of service, 29.45/80 of base pay and 3.55/80 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 41/80 of base pay for 25 or more years of service.

Pay Used for Plan Purposes. "Base pay" means the maximum monthly salary of a first grade firefighter.

Disability Retirement

Eligibility.

First Class Disability. Disabled to the extent that no longer able to perform the duties of a firefighter or any manual labor.

Second Class Disability. Disabled to the extent that no longer able to perform duties of a firefighter but able to perform light manual labor or office work.

Third Class Disability. Disable to the extent that no longer able to perform duties of a firefighter but able to perform other manual labor.

Amount.

First Class Disability. 41/80 of base pay.

Second Class Disability. 33/80 of base pay.

Third Class Disability. 25/80 of base pay.

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

Eligibility.

Spouse. Married to member at separation from service and residing with member at time of death payable for life. (For service or deferred retirement, must have been married at least one year before separation from service.)

Child. Younger than age 18 or, if full-time student, younger than age 22.

Amount.

Spouse. 22/80 of base pay.

Child. 8/80 of base pay per child. Children's maximum is 20/80 if spouse is receiving or 41/80 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 changed simultaneously by the same percent that base pay is changed.

Member Contributions. 8% of base pay. After 25 years of service, member contributions are paid to a separate health insurance account. Member contributions are non-refundable.

Minneapolis Fire Department Relief Association

Derivation of Valuation Assets

Valuation Date December 31	(a) Market Value	(b) Book Value	(c) Market-Book
1990	$120,809,562	$106,411,204	$14,398,358
1991	152,443,163	117,533,086	34,910,077
1992	164,042,664	127,742,807	36,299,857
(d) Average Unrealized Gain			$ 28,536,097
(e) Excess Investment Income*			0
(f) Assets 12/31/92 (Book Value 12/31/92 + (d) - (e))			$156,278,904#

* Excess investment income was reported by Minneapolis Fire Department Relief Association to be zero.

\# Does not include contributions made by members who have 25 or more years of service.

Section C

Valuation Methods and Assumptions

Minneapolis Fire Department 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 57, attained age if older. It was further assumed that 85% of the members would have eligible beneficiaries.

Mortality Table*

	Single Life Values: Present Value of $1 Monthly					
	Level For Life		Increasing 4.0% Yearly		Future Life Expectancy (Years)	
Sample Ages	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

Sample Ages	Present Pay Resulting in Pay of $1,000 at Age 60	Present Increase in Pay During Next Year
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

Sample Ages	% of Active Members Becoming Disabled within Next Year
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 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, 1992, the unfunded pension benefit obligation was $78,270,026 determined as follows:

Pension Benefit Obligation:	
Retirants and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$126,536,448
Current employees --	
Accumulated employee contributions including allocated investment income	0
Employer financed	79,476,385
Total Pension Benefit Obligation	$206,012,833
Net assets available for benefits, at cost (market value was $164,042,664)	127,742,807
Unfunded Pension Benefit Obligation	$ 78,270,026

The total pension benefit obligation as of January 1, 1992 was $196,039,886. During the year, the plan experienced a net change of $9,972,947 in the pension benefit obligation. Of that change, $2,823,002 was attributable to changes in benefit provisions used for determination of this value.

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 $8,727,289 -- $7,667,121 employer and $1,060,168 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 $2,209,832 for normal cost and $5,457,289 for amortization of the unfunded actuarial accrued liability. Employer contributions represented 55.34% 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	Contribution Rates: Normal Cost % of Valuation Payroll	Contribution Rates: UAAL Dollars	Valuation Payroll	Dollar Contribution For Fiscal Year: Computed	Dollar Contribution For Fiscal Year: Actual
1987	1985	19.28%	$8,906,560	$14,291,838	$11,662,026	$11,810,118
1988	1986	19.23	8,633,067	14,190,588	11,361,917	11,470,785
1989	1987	19.19	8,311,114	14,431,511	11,080,521	11,147,809
1990*#	1988	15.37	7,793,970	14,045,668	9,952,789	9,198,097
1991	1989	15.33	6,957,374	14,067,027	9,113,849	8,349,157
1992#	1990	15.95	6,687,685	13,854,744	8,897,517	7,667,121
1993	1991	15.85	5,522,371	13,664,649	7,688,218	
1994#	1992	15.90	5,123,898	13,614,231	7,288,561	

\# After change in benefit provisions.
* After changes in 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	$ 79,157,282	$189,250,921	41.8%	$110,093,639	$14,431,511	762.9%
1988	87,328,260	183,297,021	47.6	95,968,761	14,045,668	683.3
1989	99,749,893	187,552,009	53.2	87,802,116	14,067,027	624.2
1990	106,411,204	191,172,481	55.7	84,761,277	13,854,744	611.8
1991	117,533,086	196,039,886	60.0	78,506,800	13,664,649	574.5
1992	127,742,807	206,012,833	62.0	78,270,026	13,614,231	574.9

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.

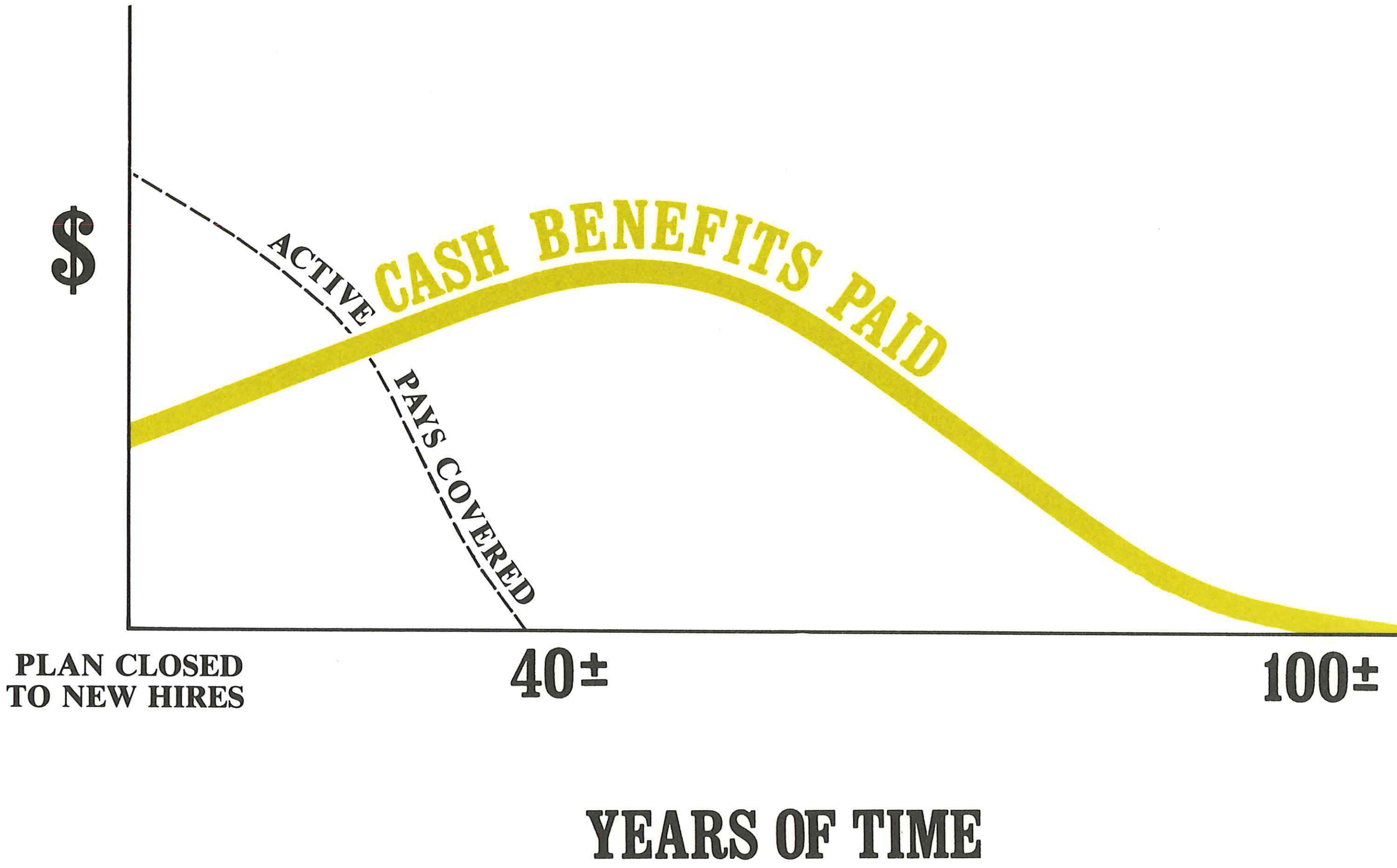
Computing Contributions To Support Plan Benefits. From a given schedule of benefits and from the employee data and asset data furnished him, the actuary determines the contribution rates to support the benefits by means of an actuarial valuation and a funding method.

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.