

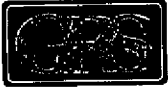
**The Report of the  
Forty-Sixth Annual Actuarial Valuation  
of the  
City of Sioux Falls Firefighters' Pension Fund  
December 31, 2001**

**GABRIEL, ROEDER, SMITH & COMPANY**



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**GABRIEL, ROEDER, SMITH & COMPANY**

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May 9, 2002

The Retirement Board  
City of Sioux Falls Firefighters' Pension Fund  
Sioux Falls, South Dakota

Ladies and Gentlemen:

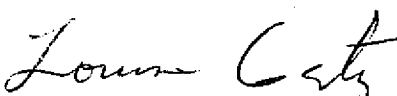
Presented in this report are the results of the **Forty-Sixth Annual Actuarial Valuation** of the assets, actuarial values and contribution requirements associated with pension and post-retirement health insurance benefits provided by the City of Sioux Falls Firefighters' Pension Fund. The purpose of the valuation was to measure the System's funding progress and to determine a contribution rate for the second following calendar year.


The date of the valuation was December 31, 2001.

The valuation was based upon information, furnished by your Secretary, concerning Pension Fund benefits, financial transactions, and individual members, terminated members, retirees and beneficiaries. Data was checked for year-to-year consistency but was not otherwise audited.

To the best of our knowledge this report is complete and accurate and was made in accordance with standards of practice prescribed by the Actuarial Standards Board and in compliance with the statutes governing the Pension Fund. The actuarial assumptions used for the valuation produce results which we believe are reasonable.

Respectfully submitted,

  
Louise M. Gates, ASA, MAAA

  
W. James Koss, ASA, EA, MAAA

LMG/WJK:ct

**SECTION A**



**VALUATION RESULTS**

## FINANCIAL OBJECTIVE

The financial objective of the Pension Fund is to establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level from year-to-year and will accumulate reserves during members' working lifetimes which will be sufficient to pay promised benefits throughout retirement.

## CONTRIBUTION RATES

The Pension Fund is supported by member contributions, City contributions, State contributions (insurance premium taxes) and investment income from Pension Fund assets.

Contributions which satisfy the financial objective are determined by an annual actuarial valuation and are sufficient to:

- (1) cover the actuarial present value of benefits assigned to the current year by the actuarial cost methods described in Section C (the normal cost); and
- (2) amortize over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (unfunded actuarial accrued liability).

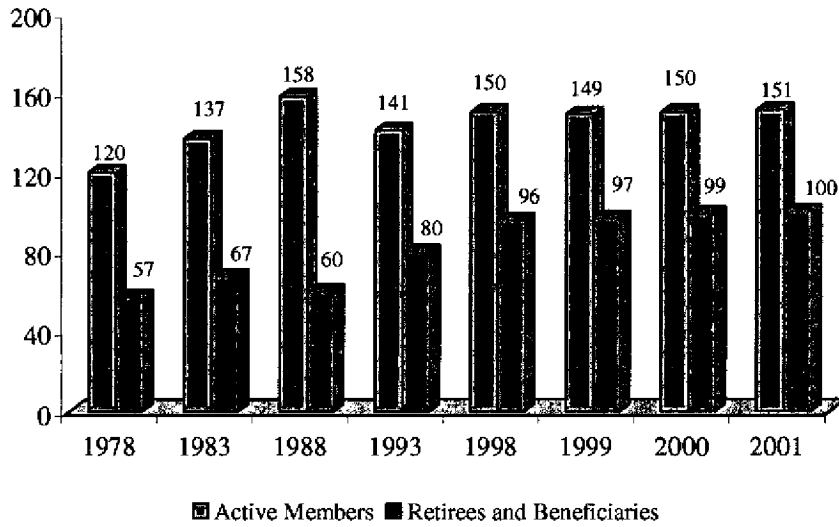
Contribution requirements for the year beginning January 1, 2003 are shown on page A-2.

**CONTRIBUTIONS COMPUTED TO MEET THE  
FINANCIAL OBJECTIVE OF THE PENSION FUND  
FOR THE YEAR BEGINNING JANUARY 1, 2003  
(INCLUDING STATE CONTRIBUTIONS)**

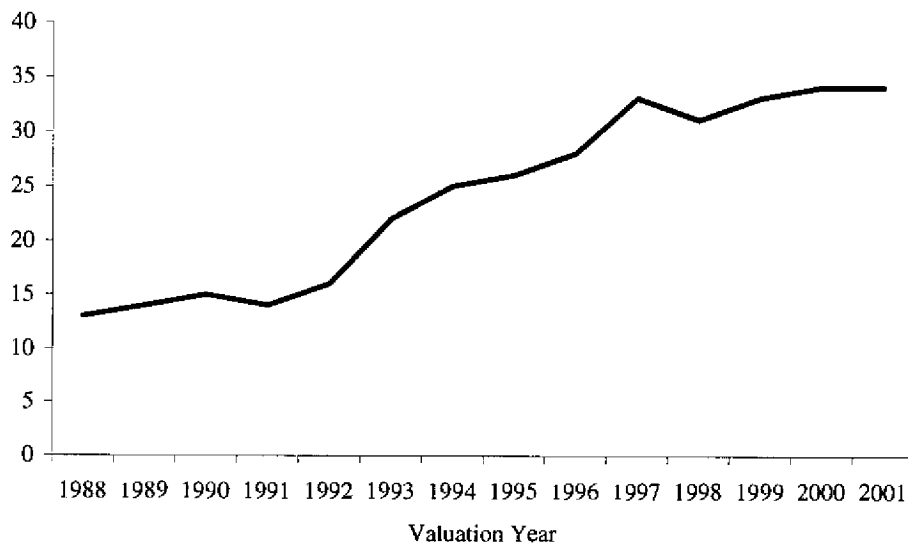
Contributions for	Range of Contribution Requirements Expressed as Percents of Payroll
Normal Cost	
Age & service benefits	15.59 %
Death-in-service benefits	0.70
Disability benefits	0.77
Termination benefits	
Deferred age & service benefits	0.16
Refunds of member contributions	0.84
Total Normal Cost	18.06 %
Unfunded Actuarial Accrued Liabilities	
Total UAAL Contribution (1)	(2.83) %
Total Computed Contribution Rate	
Member portion	8.00
City-State portion	7.23 %

- (1) The excess of valuation assets over actuarial accrued liabilities were amortized as a level percent of active member payroll over a period of 22 years, producing an amortization credit of 2.83% of payroll.

## ACTIVE AND RETIRED MEMBERS



## BENEFITS AS A PERCENT OF PAYROLL



## COMPUTED AND ACTUAL CITY-STATE PENSION CONTRIBUTIONS COMPARATIVE STATEMENT

Fiscal Year	Valuation Date December 31	Actual Dollar Contrib.	Valuation Payroll	Projected Payroll*	% of Payroll Contributions
1988	1986	\$ 796,415	\$3,760,578	\$4,068,945	16.78 %
1989	1987	758,137	4,232,403	4,579,460	16.11
1990	1988 #@	651,993	4,256,673	4,426,940	14.34
1991	1989 #@	624,412	4,421,220	4,642,281	13.51
1992	1990 #@	868,964	4,646,153	4,878,461	15.16
1993	1991 #	1,118,696	5,286,969	5,551,318	19.35
1994	1992 @	1,245,797	5,476,906	5,750,751	21.19
1995	1993	1,225,773	5,283,317	5,547,483	20.48
1996	1994	1,241,647	5,484,638	5,758,870	20.46
1997	1995	1,202,542	5,682,043	5,966,145	20.07
1998	1996	1,289,764	5,791,398	6,080,968	19.80
1999	1997 *@	1,089,024	5,673,224	5,928,519	16.77
2000	1998 @	911,935	6,254,807	6,536,273	14.43
2001	1999 **	741,051	6,265,176	6,547,109	10.48
2002	2000 **		6,236,863	6,517,522	7.86
2003	2001 **		6,860,428	7,169,147	7.23

# After changes in benefit provisions.

@ After changes in actuarial assumptions or methods.

\* The valuation payroll is projected from the valuation date to the appropriate fiscal year. The current projection factor is equal to 1.045.

\*\* Reflects amortization credit.



# ACTUARIAL PENSION BALANCE SHEET - DECEMBER 31, 2001

## Present Resources and Expected Future Resources

A. Valuation assets	\$66,493,766
B. Actuarial present value of expected future employer contributions	
1. For normal costs	6,342,061
2. For unfunded actuarial accrued liabilities	<u>(2,972,208)</u>
3. Total	3,369,852
C. Actuarial present value of expected future member contributions	<u>5,004,759</u>
D. Total Actuarial Present Value of Present and Expected Future Resources	<u><u>\$74,868,378</u></u>

## Actuarial Present Value of Expected Future Benefit Payments and Reserves

A. To retirees and beneficiaries	\$30,488,652
B. To vested terminated members	796,465
C. To present active members	
1. Allocated to service rendered prior to valuation date	32,236,441
2. Allocated to service likely to be rendered after valuation date	<u>11,346,820</u>
3. Total	<u>43,583,261</u>
D. Reserves	
1. Allocated to retirants and beneficiaries	0
2. Unallocated investment income	0
3. Total	0
E. Total Actuarial Present Value of Expected Future Benefit Payments and Reserves	<u><u>\$74,868,378</u></u>

**DERIVATION OF ACTUARIAL GAIN (LOSS)  
YEAR ENDED DECEMBER 31, 2001**

The actuarial gains or losses realized in the operation of the Pension Fund provide an experience test. Gains and losses are expected to cancel each other over a period of years (in the absence of double-digit inflation) and sizable year to year fluctuations are common. Detail on the derivation of the actuarial gain (loss) is shown below, along with a year by year comparative schedule.

(1) UAAL* at start of year	\$(2,116,670)
(2) Normal cost	1,123,259
(3) Actual contributions	1,290,075
(4) Interest accrual	(176,006)
(5) Expected UAAL before changes	(2,459,492)
(6) Change from benefit increases	none
(7) Change from revised actuarial methods	none
(8) Expected UAAL after changes	(2,459,492)
(9) Actual UAAL at end of year	(2,972,208)
(10) Gain (loss) (8) - (9)	512,716
(11) Gain (loss) as percent of actuarial accrued liabilities at start of year	0.9%

\* *Unfunded actuarial accrued liability*

<u>Valuation Date December 31</u>	<u>Actuarial Gain (Loss) As % of Beginning Accrued Liabilities</u>
1990	(2.4) %
1991	(1.4)
1992	(1.2)
1993	3.2
1994	(0.6)
1995	0.7
1996	1.4
1997	6.4
1998	5.8
1999	7.9
2000	6.3
2001	0.9

**POST-RETIREMENT HEALTH INSURANCE  
CITY'S COMPUTED CONTRIBUTIONS FOR THE  
FISCAL YEAR BEGINNING JANUARY 1, 2003**

<u>Contributions for</u>	<u>Computed Employer Contributions As % of Active Payroll</u>
Normal Cost	1.34 %
UAAL Contribution	<u>2.38</u>
TOTAL COMPUTED CITY RATE	3.72 %
DOLLAR CONTRIBUTION BASED ON VALUATION PAYROLL*	\$266,692

\* *Projected to coming fiscal year, Projection factor is equal to 1.045*

Unfunded actuarial accrued liabilities (UAAL) were amortized as a level percent of active member payroll over a period of 22 years.

**POST-RETIREMENT HEALTH INSURANCE  
COMPARATIVE STATEMENT**

Fiscal Year	Valuation Date December 31	Actual Dollar Contrib.	Valuation Payroll	Projected Payroll*	% of Payroll Contributions
1989	1987	\$ 25,187	\$4,232,403	\$4,579,460	0.55 %
1990	1988 @	25,923	4,256,673	4,426,940	0.58
1991	1989 @	47,815	4,421,220	4,642,281	1.24
1992	1990 @	72,689	4,646,153	4,878,461	1.49
1993	1991	88,265	5,286,969	5,551,318	1.59
1994	1992	95,462	5,476,906	5,750,751	1.66
1995	1993 @	103,183	5,283,317	5,547,482	1.86
1996	1994	118,632	5,484,638	5,758,870	2.06
1997	1995	120,516	5,682,043	5,966,145	2.02
1998	1996	110,674	5,791,398	6,080,968	1.82
1999	1997 @	127,183	5,673,224	5,928,519	2.03
2000	1998	122,243	6,254,807	6,536,273	1.96
2001	1999	137,209	6,265,176	6,547,109	2.00
2002	2000 @		6,236,863	6,517,522	3.01
2003	2001 @		6,860,428	7,169,147	3.72

\* The valuation payroll is projected from the valuation date to the appropriate fiscal year. The current projection factor is equal to 1.045.

@ After changes in actuarial assumptions or methods.

## COMMENTS, RECOMMENDATIONS, AND CONCLUSIONS

**Comment A:** Overall experience was favorable during the year ended December 31, 2001. There was a net experience gain of \$0.5 million. Recognized investment income in excess of the long-term assumed rate was the primary source of the favorable experience. The favorable experience was offset in part by pay increases in excess of assumed rates. It is important to note that during the year 2001 the market value rate of return was significantly lower than the assumed rate. In contrast, the rate of return on a funding value basis was higher than assumed. This difference is due to the recognition of prior investment gains (a feature of the asset smoothing method).

**Comment B:** Pension assets exceeded pension accrued liabilities by \$2.9 million. This excess (full funding credit) was amortized as a level percent-of-payroll over a 22 year period and applied as a credit to the normal cost contribution rate. There is no universally accepted procedure for computing the City's contribution in the presence of a full funding credit. The magnitude of the credit and, in fact, the use of the credit at all is a matter of policy. The figures on page A-2, represent one reasonable approach. A shorter period would result in a larger offset to the normal cost contribution rate.

**Comment C:** In recognition of recent changes in the medical plan options offered to retirees, a new method was used in this valuation to develop premiums and recognize the change in utilization of medical plans among retirees. The method is described in Section C of this report. This new method recognizes a weighted average of premiums from both the indemnity and managed care plans in developing retiree health contribution rates.

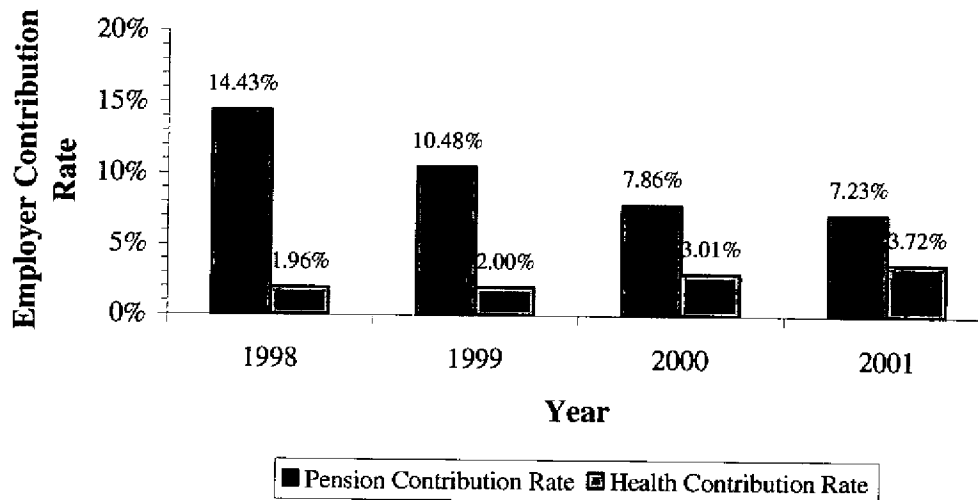
**Conclusion:** The Pension Fund is in good financial condition in accordance with actuarial principles of level percent-of-payroll financing. In order for this to continue, investment markets will have to rebound from their current disappointing levels.

## Contribution Summary For the Year Beginning January 1, 2003

Contributions for	Computed Employer Contributions Expressed As Percents of Payroll		
	Pension	Health	Total
Total Normal Cost	18.06 %	1.34 %	19.40 %
Unfunded Actuarial Accrued Liability			
Total UAAL Contribution (1)	(2.83)	2.38	(0.45)
Total Computed Contribution Rate	15.23	3.72	18.95
Member portion	8.00	0.00	8.00
City-State portion	7.23 %	3.72 %	10.95 %

- (1) Unfunded actuarial accrued liabilities were amortized as a level percent of active member payroll over 22 years.

### Computed Employer Contribution Rate Expressed as % of Active Member Payroll



**SECTION B**



**SUMMARY of BENEFIT PROVISIONS  
AND VALUATION DATA**

**BENEFIT PROVISIONS EVALUATED  
AND/OR CONSIDERED  
(DECEMBER 31, 2001)**

**Regular Retirement:**

*Eligibility* - Age 55 with 20 or more years of service; or the sum of a member's age and years of service equals eighty (80) with a minimum retirement age of 50.

*Mandatory Retirement Age* - Age 60 (age 70 with employer consent).

*Annual Amount* - Final average compensation times the sum of a) 2.5% times the first 25 years of service, plus b) 1.5% times service in excess of 25 years.

*Type of Final Average Compensation* - Average of last 3 years before retirement. Some lump sums are included.

**Early Reduced Retirement:**

*Eligibility* - 20 or more years of service.

*Annual Amount* - Same as regular retirement except that the benefit is actuarially reduced.

**Deferred Retirement (vested benefit):**

*Eligibility* - 15 years of service; benefit payable at age 60.

*Annual Amount* - Computed as a regular retirement benefit but based on service and final average compensation at termination.

**Duty Disability Retirement:**

*Eligibility* - No age or service requirements. Must be in receipt of Workers' Compensation.

*Annual Amount* - Computed as a regular retirement benefit, based on a minimum of 10 years of service. Minimum benefit is 50% of a first-class firefighter's salary. Workers' compensation payments are offset.



**BENEFIT PROVISIONS EVALUATED  
AND/OR CONSIDERED  
(DECEMBER 31, 2001)**

**Non-Duty Disability Retirement:**

*Eligibility* - 10 years of service.

*Annual Amount* - Computed as a regular retirement benefit. Minimum benefit is 20% of a first-class firefighter's salary.

**Duty Death Before Retirement:**

*Eligibility* - No age or service requirement. Also payable in case of death of duty-disability retirant within 5 years of retirement. Workers' Compensation must be payable.

*Annual Amount* - Refund of accumulated contributions. Spouse receives a pension of 1/3 of first-class firefighter's salary until death. Unmarried children under age 18 or an eligible handicapped child will receive equal share of 1/4 of a first-class firefighter's salary (if no spouse, each child receives 1/4 to a maximum of 1/2). The minimum monthly benefit for each eligible child is \$200. If there are no spouse or eligible children, dependent parents each receive 1/6 of a first-class firefighter's salary. Workers' Compensation payments are offset.

**Non-Duty Death Before Retirement:**

*Eligibility* - 10 years of service.

*Annual Amount* - Surviving spouse receives a monthly benefit for life computed as a regular retirement benefit but actuarially reduced in accordance with a 100% joint and survivor election. In addition each eligible or handicapped child is paid a minimum monthly benefit of \$200.

**Post-Retirement Cost-of-Living Adjustments:**

An annual increase equal to 100% of the CPI change in June of each year with a cap of 3%. The first increase is granted after 36 months of retirement.

**Member Contributions:**

8% of compensation.

## REPORTED FUND BALANCES

Reserves	Reported Fund Balances Market Value	
	2001	2000
Pension Savings Fund	\$ 6,824,793	\$ 6,278,959
Pension Reserve Fund	36,490,127	40,308,924
Retirement Reserve Fund	19,524,824	18,237,737
Income/Expense Fund	35,083	74,436
<b>Total Fund Balances</b>	<b>\$62,874,827</b>	<b>\$64,900,056</b>

*In financing pension actuarial accrued liabilities, valuation assets of \$61,130,023 were distributed as follows:*

Reserves	Valuation Assets Applied to Actuarial Accrued Liabilities for			Totals
	Active & Inactive Members	Retirees & Beneficiaries	Contingency Reserve	
Pension Savings Fund	\$ 6,824,793	\$	\$	\$ 6,824,793
Pension Reserve and Expense Fund	29,180,321	10,963,828		40,144,149
Retirement Reserve Fund		19,524,824		19,524,824
<b>Total</b>	<b>\$36,005,114</b>	<b>\$30,488,652</b>	<b>\$ 0</b>	<b>\$66,493,766</b>

## DERIVATION OF VALUATION ASSETS

	<u>Pension</u>	<u>Health</u>	<u>Total</u>
Assumed Interest	8.00%	8.00%	8.00%
A. Funding Value, 12/31/00	\$61,130,023	\$599,248	\$61,729,271
B. Market Value Beginning of Year	64,270,027	630,029	64,900,056
C. Non-Investment Net Cash Flow	(1,128,389)	16,754	(1,111,635)
D. Investment Income(Market total)			(913,594)
E. Market Value End of Year			62,874,827
F. Phase-in Factor			0
G. Expected Income			4,893,876
H. Market Value Gain (Loss): [(D) – (G)]			(5,807,470)
I. Method Change: [effective 12/98] #			7,889,185
J. Recognition of Gain/(Loss)			
J1. Year One			(1,161,494)
J2. Year Two			(781,113)
J3. Year Three			1,054,653
J4. Year Four #			579,491
J5. Year Five			1,972,296
J6. Total (J1...J5)			<u>1,663,833</u>
K. Funding Value, 12/31/01 [(A) + (C) + (G) + (J6)]			67,175,345
L. Funding Value Rate of Return			10.70%
M. Percent Allocation (A+C)/Total	99.00%	1.00%	100.00%
N. Re-allocated Value of Assets	\$66,493,766	\$681,579	\$67,175,345

# Four year phase-in.

**SUMMARY OF  
CURRENT ASSET INFORMATION  
REPORTED FOR VALUATION**

**Trust Assets**

	<b>December 31, 2001 Market Value</b>
Cash & equivalents	\$ 272,198
Investments	62,494,676
Accrued Interest and Dividends	142,130
	62,909,004
Less accounts payable	34,177
<b>Total Assets</b>	<b>\$62,874,827</b>

**Revenues and Expenditures of Trust**

	<b>2000</b>	<b>2001</b>
<b>Balance – January 1</b>	\$65,321,800	\$64,900,056
Revenues:		
Member contributions	377,237	549,024
Employer contributions	1,034,177	878,260
Investment income	491,515	(913,594)
<b>Total</b>	<b>1,902,929</b>	<b>513,690</b>
Expenditures:		
Benefit payments	2,082,925	2,275,493
Hospitalization Insurance	77,644	112,725
Refunds of member contributions	9,920	0
Administrative expenses	154,184	150,701
<b>Total</b>	<b>2,324,673</b>	<b>2,538,919</b>
<b>Balance - December 31</b>	<b>\$64,900,056</b>	<b>\$62,874,827</b>

**ASSET INFORMATION REPORTED FOR VALUATION  
COMPARATIVE STATEMENT - MARKET VALUE**

Year Ended Dec. 31	Assets Beginning of Year	Revenues		Expenses			Assets Year-End	
		Member Contrib.	Employer Contrib.	Investment Income	Retirement Benefits	Contrib. Refunds		Other Net Expenses
1988	\$12,844,767	\$259,965	\$ 796,415	\$1,970,751	\$ 509,130	\$ 10,165	\$106,223	\$15,246,380
1989	15,246,380	265,514	778,324	3,207,320	587,330	19,133	128,986	18,762,089
1990	18,762,089	279,338	677,916	158,461	684,729	0	137,873	19,055,202
1991	19,055,202	317,841	725,386	4,641,212	717,924	18,963	166,505	23,836,249
1992	23,836,249	335,381	941,653	1,584,015	856,200	6,965	202,347	25,631,786
1993	25,631,786	345,835	1,206,962	3,752,146	889,086	10,983	173,546	29,863,114
1994	29,863,114	352,190	1,341,259	296,937	1,199,288	0	181,309	30,472,903
1995	30,472,903	356,929	1,328,956	6,880,947	1,360,695	45,547	233,037	37,400,456
1996	37,400,456	362,418	1,360,279	5,973,417	1,463,323	50,390	219,510	43,363,348
1997	43,363,348	359,362	1,323,058	7,868,506	1,742,134	101,303	234,342	50,836,495
1998	50,836,495	384,425	1,400,438	6,319,530	1,884,691	2,132	240,655	56,813,410
1999	56,813,410	388,242	1,216,206	9,134,505	1,970,490	46,532	213,541	65,321,800
2000	65,321,800	377,237	1,034,177	491,515	2,082,927	9,920	231,827	64,900,056
2001	64,900,056	549,024	878,260	(913,594)	2,275,493	0	263,426	62,874,827

**RETIRES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS  
COMPARATIVE STATEMENT**

Year Ended Dec. 31	Added to Rolls		Removed from Rolls		Rolls End of Year		Average Annual Benefits	Present Value of Benefits	Expected Removals	
	No.	Annual Benefits	Post-Ret. Increases	No.	Annual Benefits	No.				Annual Benefits
1988	3	\$ 47,908	\$12,760	2	\$ 6,817	60	\$ 564,950	\$ 9,416	\$ 6,299,174	2.1
1989	6	54,070	14,060	1	10,638	65	622,442	9,576	6,368,281	2.1
1990	4	84,708	15,804	1	4,716	68	718,238	10,562	8,557,668	2.3
1991	1	33,057	17,999	1	3,800	68	765,494	11,257	9,493,746	2.5
1992	5	114,273	20,081	2	16,807	71	883,041	12,437	10,924,168	2.6
1993	9	287,519	2,542			80	1,173,102	14,664	15,129,832	2.6
1994	6	150,188	48,587	2	19,955	84	1,351,922	16,094	17,377,288	2.8
1995	3	90,538	22,449			87	1,464,909	16,838	18,798,048	3.0
1996	7	160,507	40,132	3	47,373	91	1,618,175	17,782	20,838,557	3.5
1997	10	268,503	28,872	2	25,146	99	1,890,404	19,095	25,386,453	3.5
1998	1	36,916	25,002	4	28,128	96	1,924,194	20,044	25,677,303	3.1
1999	3	123,405	36,296	2	19,218	97	2,064,677	21,285	27,618,722	2.8
2000	4	32,042	59,593	2	6,150	99	2,150,162	21,719	28,364,586	3.0
2001	5	138,212	66,406	4	38,747	100	2,316,033	23,160	30,488,652	3.2

**RETIREES AND BENEFICIARIES DECEMBER 31, 2001  
TABULATED BY TYPE OF BENEFITS BEING PAID**

<u>Type of Benefits Being Paid</u>	<u>No.</u>	<u>Annual Benefit</u>
Age and Service Benefits*	71	\$1,982,499
Disability Retirement Benefits	5	76,455
Survivor Benefits	24	257,079
<b>Total Plan Benefits</b>	<b>100</b>	<b>\$2,316,033</b>

\* Includes 9 survivors of age and service benefit recipients.

**RETIRES AND BENEFICIARIES -- BY ATTAINED AGES  
DECEMBER 31, 2001**

<b>Attained Ages</b>	<b>No.</b>	<b>Monthly Pensions</b>
40 - 44	1	\$ 978
45 - 49	2	2,296
50 - 54	10	19,830
55 - 59	16	47,249
60 - 64	15	40,075
65 - 69	16	35,335
70 - 74	14	20,384
75 - 79	10	13,014
80 - 84	10	9,638
85 +	6	4,204
<b>Total</b>	<b>100</b>	<b>\$193,003</b>



**VESTED DEFERRED RETIREMENTS - BY ATTAINED AGES  
DECEMBER 31, 2001**

<b>Attained Ages</b>	<b>No.</b>	<b>Monthly Pensions</b>
45 - 49	3	\$7,693
<hr/>		
<b>Totals</b>	<b>3</b>	<b>\$7,693</b>

## ACTIVE MEMBERS INCLUDED IN VALUATION

Valn. Date Dec. 31	Active Members			Vested Term.	Valuation	Average			%
	Chiefs	Other	Total	Members	Payroll	Age	Service	Pay	Incr.
1988	7	151	158		\$4,256,673	38 yrs.	12.0 yrs.	\$26,941	(0.7) %
1989	7	152	159		4,421,220	38	12.6	27,806	3.2
1990	7	152	159		4,646,153	39	12.8	29,221	5.1
1991	7	150	157		5,286,969	40	13.7	33,675	15.2
1992	7	145	152		5,476,906	40	14.4	36,032	7.0
1993	6	135	141		5,283,317	41	14.5	37,470	4.0
1994	6	141	147		5,484,638	40	14.2	37,310	-
1995	6	142	148		5,682,043	40	14.3	38,392	2.9
1996	6	142	148		5,791,398	41	14.4	39,131	1.9
1997	5	144	149		5,673,224	40	13.4	38,057	(2.7)
1998	13	136	149	2	6,254,807	41	13.9	41,699	9.6
1999	12	137	149	2	6,265,176	42	14.2	42,048	0.8
2000	12	138	150	2	6,236,863	42	14.9	41,579	(1.1)
2001	11	140	151	3	6,860,428	42	14.9	45,433	9.3

**ADDITIONS TO AND REMOVALS FROM ACTIVE MEMBERSHIP  
ACTUAL AND EXPECTED NUMBERS**

Year Ended Dec. 31	Number Added During Year		Active		Disability Retirement		Died-In- Service		Other Terminations		Members End of Year
	A	E	A	E	A	E	A	E	A	E	
	1989	3	2	1	0.8	0	0.3	1	0.3	0	
1990	4	4	4	2.4	0	0.2	0	0.3	0	3.7	159
1991	3	5	1	1.7	0	0.3	0	0.3	4	3.5	157
1992	0	5	4	1.9	0	0.3	0	0.3	1	2.6	152
1993	0	10	9	2.9	0	0.2	0	0.3	1	2.0	141
1994	10	4	4	1.5	0	0.3	0	0.3	0	1.6	147
1995	6	5	3	0.9	0	0.3	0	0.3	2	2.3	148
1996	7	7	5	0.8	0	0.3	0	0.3	2	2.5	148
1997	14	13	9	1.1	0	0.3	0	0.3	4	2.8	149
1998	5	4	1	0.3	0	0.3	0	0.2	3	4.0	150
1999	3	4	3	0.6	0	0.3	0	0.2	1	3.5	149
2000	5	4	1	0.9	1	0.3	0	0.2	2	3.1	150
2001	6	5	4	2.5	0	0.3	0	0.2	1	2.8	151
<b>5 Year Totals</b>	<b>33</b>	<b>30</b>	<b>18</b>	<b>5.4</b>	<b>1</b>	<b>1.5</b>	<b>0</b>	<b>1.1</b>	<b>11</b>	<b>16.2</b>	

*A represents actual number.*

*E represents expected number based on assumptions outlined in Section C.*

**ACTIVE MEMBERS (EXCLUDING FIRE, DEPUTY AND ASSISTANT CHIEFS)  
 DECEMBER 31, 2001  
 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
25-29	8	1						9	\$ 301,548
30-34	11	7						18	654,859
35-39	5	10	9	1				25	993,118
40-44	5	3	8	7	4			27	1,151,841
45-49	1		4	8	16	3		32	1,558,322
50-54			3	2	6	16	1	28	1,403,215
55-59						1		1	56,447
<b>Totals</b>	<b>30</b>	<b>21</b>	<b>24</b>	<b>18</b>	<b>26</b>	<b>20</b>	<b>1</b>	<b>140</b>	<b>\$6,119,350</b>

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

Age: 42.2 years.

Service: 14.4 years.

Annual Pay: \$43,710.

**ACTIVE MEMBER BATTALION CHIEFS - DECEMBER 31, 2001**  
**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.	Payroll
35-39			1					1	\$ 65,446
40-44				3	1			4	281,883
45-49				1	1	2		4	262,198
50-54						2		2	131,551
<b>Totals</b>			1	4	2	4		11	<b>\$741,078</b>

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

Age: 45.0 years.

Service: 21.4 years.

Annual Pay: \$67,371.

## **SECTION C**



# **FINANCIAL PRINCIPLES AND ACTUARIAL VALUATION PROCESS**

## ACTUARIAL COST METHODS USED FOR THE VALUATION

Normal cost and the allocation of actuarial present values between service rendered before and after the valuation date were determined using an individual entry-age actuarial cost method having the following characteristics:

- (i) the annual normal costs for each individual active member, payable from the member's actual date of employment to projected date of retirement, are sufficient to accumulate the actuarial present value of the member's benefit at the time of retirement;
- (ii) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

### *Amortization of Unfunded Actuarial Accrued Liabilities.*

Unfunded actuarial accrued liabilities were amortized as a level percent of active member payroll over a period of 22 years.

Active member payroll was assumed to increase 4.5% a year for the purpose of determining the level percent contributions.

## ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS

The actuary calculates contribution requirements and actuarial present values of a retirement system by applying actuarial assumptions to the benefit provisions and people information of the system, using the actuarial cost methods described on page C-1.

The principal areas of risk which require assumptions about future experience are:

- long-term rates of investment return to be generated by the assets of the system
- patterns of pay increases to members
- rates of mortality among members, retirees and beneficiaries
- rates of withdrawal of active members
- rates of disability among active members
- the age patterns of actual retirements.

In making a valuation, the actuary calculates the monetary effect of each assumption for as long as a present covered person survives - - - a period of time which can be as long as a century.

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The employer contribution rate has been computed to remain level from year to year so long as benefits and the basic experience and make-up of members do not change. Examples of favorable experience which would tend to reduce the employer contribution rate are:

- (1) Investment returns in excess of 8% per year.
- (2) Member non-vested terminations at a higher rate than outlined on page C-6.
- (3) Mortality among retirees and beneficiaries at a higher rate than indicated by the 1983 Group Annuity Mortality Table.
- (4) Increases in the number of active members.



## ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS.

Examples of unfavorable experience which would tend to increase the employer contribution rate are:

- (1) Pay increases in excess of the rates outlined on page C-4.
- (2) An acceleration in the rate of retirement from the rates outlined on page C-7.
- (3) A pattern of hiring employees at older ages than in the past.

---

*Actual experience* of the system will not coincide exactly with assumed experience, regardless of the choice of the assumptions, or the skill of the actuary and the precision of the calculations. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time one or more of the assumptions are modified to reflect experience trends (but not random or temporary year to year fluctuations).

### **Asset Valuation Method**

Valuation assets are equal to reported market value of assets. Investment gains and losses are spread over a period of 5 years, with 20% recognition the first year. Such spreading reduces the fluctuation in the City's computed contribution rate which might otherwise be caused by market value fluctuations. The details of this spreading technique are shown in Section B of this report.

## ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION

**Investment Return** (net of administrative expenses).

8.00% per year, compounded annually. This rate consists of a net real rate of return of 3.50% a year plus a long-term rate of wage inflation of 4.5% a year.

This assumption is used to equate the value of payments due at different points in time and was first used for the December 31, 1997 valuation. Approximate rates of investment return, for the purpose of comparisons with assumed rates, are shown below. The average increases in active member pay are also shown for comparative purposes.

	Year Ended December 31,				
	2001	2000	1999	1998	1997
Rate of Investment Return	10.7%	12.8%	15.5%	26.1%	14.5%
Average Increase in Pay	9.3	(1.1)	0.8	9.5	(2.7)

The nominal rate of return was computed using the approximate formula  $i = I$  divided by  $1/2(A + B - I)$ , where  $I$  is actual investment income net of expenses,  $A$  is the beginning of year asset value, and  $B$  is the end of year asset value.

These rates of return should not be used for measurement of an investment advisor's performance or for comparisons with other systems -- *to do so will mislead.*

**Pay Projections.** These assumptions are used to project current pays to those upon which benefits will be based. The assumptions were first used for the December 31, 1997 valuation.

Sample Ages	Annual Rate of Pay Increase for Sample Ages		
	Base (Economic)	Merit and Longevity	Total
20	4.5 %	1.7 %	6.2 %
25	4.5	1.6	6.1
30	4.5	1.2	5.7
35	4.5	0.9	5.4
40	4.5	0.4	4.9
45	4.5	0.3	4.8
50	4.5	0.2	4.7
55	4.5	0.2	4.7
60	4.5	0	4.5

## ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION

If the number of active members remains constant, the total active member payroll will increase 4.5% annually, the base portion of the individual pay increase assumptions. This increasing payroll was recognized in amortizing unfunded actuarial accrued liabilities.

Changes actually experienced in average pay and total payroll have been as follows:

Increase in	Year Ended December 31					December 31, 2001	
	2001	2000	1999	1998	1997	3 Year Average	5 Year Average
Average pay	9.3	(1.1)	0.8	9.5	(2.7)	3.0	3.2
Total payroll	10.0	(0.5)	0.2	10.3	(2.0)	3.2	3.6

**Mortality Table.** The 1983 Group Annuity Mortality Table, set back 0 years for men and 5 years for women. This table was first used for the December 31, 1997 valuation. Sample values follow:

Sample Ages	Actuarial Present Value of		Future Life	
	\$1 Monthly for Life		Expectancy (Years)	
	Men	Women	Men	Women
55	\$124.57	\$134.74	24.82	30.23
60	115.04	127.23	20.64	25.67
65	103.26	117.61	16.69	21.28
70	90.18	105.53	13.18	17.13
75	76.40	91.57	10.15	13.37
80	62.65	77.15	7.64	10.20

This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement.

## ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION

*Rates of separation from active membership.* The rates do not apply to members eligible to retire and do not include separation on account of death or disability. This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	Current Rates Percent Separating within Next Year
ALL	0	15.0 %
	1	10.0
	2	8.0
	3	7.0
	4	6.0
25	5 & Over	2.5
30		2.0
35		1.5
40		1.0
45		0.5
50		-
55		-
60		-

The current rates were first used in the December 31, 1993 valuation.

*Rates of Disability.* These assumptions represent the probabilities of active members becoming disabled.

Sample Ages	Percent 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

These rates were first used for the December 31, 1976 valuation.

## ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION

**Rates of Retirement.** These rates are used to measure the probabilities of an eligible member retiring during the next year.

Retirement Ages	Percents of Active Members Retiring within Next Year	
	Regular Retirement Rates	Early Retirement Rates
50	30 %	5 %
51	30	5
52	30	5
53	30	5
54	30	5
55	30	
56	20	
57	20	
58	20	
59	30	
60 & Over	100	

A member was assumed to be eligible for regular retirement after attaining age 55 with 20 or more years of service, or if the sum of age and service equals eighty (80). A member was assumed to be eligible for early reduced retirement after completing 20 years of service and attaining age 50.

The current rates were first used for the December 31, 1997 valuation.

**Lump sum payments** included in the calculation of the average pay upon which benefits are computed were assumed to increase benefits by 10 percent.

**Active Member Group Size.** The number of active members was assumed to remain constant. This assumption is unchanged from previous valuations.

## POST-RETIREMENT HEALTH INSURANCE

The City supplied a current schedule of City-paid premiums and a list of current retirees indicating the type of coverage elected by each retiree. An historical premium schedule is shown below:

Type	City Paid Monthly Premium		
	12/99	12/00	12/01
Retiree Only	\$ 86.52	\$112.48	\$148.99
Retiree & Spouse	173.04	236.09	312.73

The City pays 50% of the total premium cost. Retired members pay the remaining portion (50%). Health insurance coverage terminates upon attainment of age 65.

Eighty percent of future retired members were assumed to be married.

Premiums shown above were assumed to increase in future years as follows:

Year	Rate
1	11 %
2	10
3	9
4	8
5	7
6	6
7	5
8	4.5
9	4.5
10	4.5
11	4.5
12+	4.5

Effective with the December 31, 2001 valuation, a new indemnity plan option was added, and a significant number of Plan participants changed health plans. The premiums used in this valuation of the system, reflect the change in health plan utilization, and are based on a weighted average of premiums in each plan.

## DEFINITIONS OF TECHNICAL TERMS

**Accrued Service.** Service credited under the system which was rendered before the date of the actuarial valuation.

**Actuarial Accrued Liability.** The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as "past service liability."

**Actuarial Assumptions.** Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future benefits" between future normal costs and actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

**Actuarial Equivalent.** One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.

**Actuarial Gain (Loss).** The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities -- during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.

**Actuarial Present Value.** The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payment.

## DEFINITIONS OF TECHNICAL TERMS

*Amortization.* Paying off an interest-discounted amount with periodic payments of interest and (generally) principal -- as opposed to paying it off with a lump sum payment.

*Normal Cost.* The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as "current service cost."

*Unfunded Actuarial Accrued Liabilities.* The difference between actuarial accrued liabilities and valuation assets. Sometimes referred to as "unfunded past service liability" or "unfunded supplemental present value."

Most retirement systems have unfunded actuarial accrued liabilities. They arise each time new benefits are added and each time an actuarial loss occurs. The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).



## MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

Marriage Assumption:	80% of participants are assumed to be married for purposes of death and retiree health benefits. In each case the male was assumed to be 3 years older than the female.
Pay Increase Timing:	Beginning of year.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Other:	Disability and turnover decrements do not operate during retirement eligibility.
Miscellaneous Loading Factors:	The calculated normal retirement benefits were increased by 10% to account for the inclusion of unused sick leave, vacation time, and comp. time in the calculation of Average Compensation.
Disability Assumption:	Fifty percent of disabilities were assumed to be duty related. Fifty percent were assumed to be unrelated to duty. The recovery rate from disability was assumed to be 0 (i.e., no disabled individual was assumed to recover and return to work.
Death Assumption:	Fifty percent of deaths were assumed to be duty related. Fifty percent were assumed to be unrelated to duty.
Non-forfeiture Assumption:	All vested terminated members were assumed to elect a deferred retirement benefit.

**BENEFITS WITH AND WITHOUT LUMP SUM PAYMENTS  
FOR NEW RETIRANTS**

**Comparative Schedule**

Year Ending	One Year Ratio		Three Year Ratio	
	Final Average Compensation (FAC)		3 Year Sum of FAC	
	With Lump Sum	Without Lump Sum	With Lump Sum	Without Lump sum
		Ratio		Ratio
12/31/99	\$259,278	\$221,124	1.173	
12/31/00	100,513	92,517	1.086	
12/31/01	64,248	56,620	1.135	\$370,261
				1.145

**Lump Sum Load.** Retirement liabilities are increased by a factor of 10% to compensate for the use of unused sick leave, unused vacation time, and comp. time.

## **SECTION D**



**CERTAIN DISCLOSURES REQUIRED BY  
STATEMENTS NOS. 25, 26 AND 27 OF THE  
GOVERNMENTAL ACCOUNTING STANDARDS BOARD**

**GASB Statement No. 25**  
**Required Supplementary Information**

**Schedule of Pension Funding Progress**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) -- Entry-Age -- (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	UAAL as a % of Covered Payroll (b-a)/c
1992	\$24,648,743	\$30,607,487	\$ 5,958,744	80.5 %	\$5,476,906	108.8 %
1993	28,840,254	34,418,582	5,578,328	83.8	5,283,317	105.6
1994	31,479,741	37,118,749	5,639,008	84.8	5,484,638	102.8
1995	34,525,942	39,807,550	5,281,608	86.7	5,682,043	93
1996	37,502,893	42,454,120	4,951,227	88.3	5,791,398	85.5
1997	42,642,037	47,505,052	4,863,015	89.8	5,673,224	85.7
1998	48,194,168	50,952,881	2,758,713	94.6	6,254,807	44.1
1999	54,931,107	53,515,826	(1,415,281)	102.6	6,265,176	-
2000	61,130,023	59,013,354	(2,116,670)	103.6	6,236,863	-
2001	66,493,766	63,521,558	(2,972,208)	104.7	6,860,428	-

**Schedule of Employer Pension Contributions**

Valuation Year Ended December 31	Fiscal Year Ended December 31	Computed Dollar Contribution Rates as % of Valuation Payroll	Contribution Based on Valuation Payroll	Annual Required Contribution Based on Actual Payroll*	% Contribu
1990	1992	15.16 %	\$ 739,575	\$ 830,299	100
1991	1993	19.35	1,074,180	1,022,322	100
1992	1994	21.19	1,218,584	1,162,195	100
1993	1995	20.48	1,136,124	1,163,682	100
1994	1996	20.46	1,178,265	1,184,920	100
1995	1997	20.07	1,197,405	1,138,616	100
1996	1998	19.8	1,204,032	1,238,452	100
1997	1999	16.77	994,213	1,050,670	100
1998	2000	14.43	943,184	899,979	100
1999 #	2001	10.48	656,590	718,973	100
2000 #	2002	7.86	490,217		
2001 #	2003	7.23	518,329		

\* Employer contributions are based on computed percent and actual payroll.

# Reflects amortization credit.

## GASB Statement No. 25 Required Supplementary Information

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	December 31, 2001
Actuarial Cost Method	Entry-Age
Amortization method	Level percent closed
Remaining amortization period	22 years
Asset valuation method	5 year smoothed market
Actuarial assumptions:	
Investment rate of return	8.00%
Projected salary increases*	4.5%-6.2%
*Includes inflation at	4.50%
Cost-of-living adjustments	Annual increase equal to CPI in June with a cap of 3% beginning 3 years after retirement.

Membership of the plan consisted of the following at December 31, 2001, the date of the latest actuarial valuation:

Retirees and beneficiaries receiving benefits	100
Terminated plan members entitled to but not yet receiving benefits	3
Active plan members	<u>151</u>
Total	254

**GASB Statement No. 26**  
**Required Supplementary Information**  
**Statement of Plan Net Assets**  
**(Includes Retiree Health)**  
**As of December 31, 2001**

Assets:

Cash and equivalents	\$ 272,198
Accrued Interest and Dividends	142,130
Total	<u>414,328</u>

Investments, at market value:

Northern Trust	17,514,366
Mutual Funds	29,114,015
Starbuck	9,395,414
Alliance Cap	6,470,881
Total Investments	<u>62,494,676</u>

Total Assets	<u>62,909,004</u>
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Less accounts payable	<u>34,177</u>
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Net assets held in trust for pension and health benefits	\$62,874,827
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**GASB Statement No. 26**  
**Required Supplementary Information**  
**Statement of Plan Net Assets**  
**(Includes Retiree Health)**  
**As of December 31, 2001**

	<u>Pension</u>	<u>Retiree Health</u>	<u>Total</u>
<b>Additions:</b>			
Contributions			
Employer	\$ 747,287	\$ 130,973	\$ 878,260
Plan members	549,024		549,024
Total	<u>1,296,311</u>	<u>130,973</u>	<u>1,427,284</u>
Investment income			(913,594)
Miscellaneous			0
Total Additions			<u>513,690</u>
<b>Deductions:</b>			
Pension Benefits Paid	2,275,493		2,275,493
Refunds of Contributions	0		0
Health Premiums		112,725	112,725
Administrative Expenses	150,701		150,701
Total Deductions	<u>2,426,194</u>	<u>112,725</u>	<u>2,538,919</u>
Net Increase (Decrease)			(2,025,229)
Net assets held in Trust Fund:			
Beginning of year			\$64,900,056
End of year			\$62,874,827