



CITY OF DETROIT



**Policemen and Firemen
Retirement System**



**60th Annual Actuarial Valuation
June 30, 2001**

Gabriel, Roeder, Smith & Company



Actuaries & Consultants



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December 19, 2001

Board of Trustees
City of Detroit Policemen and Firemen
Retirement System

The results of the **60th Annual Actuarial Valuation** of the annuity and pension liabilities of the City of Detroit Policemen and Firemen Retirement System are presented in this report. The purpose of the valuation was to measure the System's funding progress and to determine an appropriate contribution level for the next fiscal year.

The date of the valuation was **June 30, 2001**.

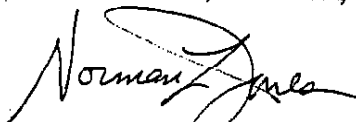
The actuarial assumptions used in the valuation are summarized in the appendix. Benefit provisions are summarized on pages 13-14. The statistical data concerning the active, inactive and retired persons covered by the System was furnished by the retirement system staff, together with needed financial information. Data was checked for year-to-year consistency, but was not otherwise audited by the actuary.

Your attention is directed particularly to the employer contribution rates on page 2, the COMMENTS on page 12, and the Financial Objective on pages 24-25.

The valuation was completed using generally accepted actuarial principles and in accordance with standards of practice prescribed by the Actuarial Standards Board. To the best of our knowledge this report is complete and accurate and the actuarial method and assumptions produce results which are reasonable.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY


Norman L. Jones


Judith A. Kermans

NLJ/rgs/lr

VALUATION RESULTS



**EMPLOYER CONTRIBUTION RATES
COMPUTED PAYABLE LAST DAY OF FISCAL YEAR
EXPRESSED AS PERCENTS OF ACTIVE MEMBER PAYROLL
2002-2003 FISCAL YEAR**

Contributions for	Contributions Expressed as Percents of Payroll
Normal Cost	
Age & service allowances	18.14 %
Disability allowances	11.66 %
Duty death allowances	0.52 %
Total	30.32 %
Members current contributions: #	3.70 %
(Future refunds)	(0.60)%
Available for monthly benefits	3.10 %
Employer Normal Cost	27.22 %
Actuarial Accrued Liabilities	
Total (\$ Millions)	\$3,463.2
Funding Value of Assets	3,900.0
Full Funding Credit - dollars	\$ (436.8)
- 16 year amortization	(14.24)%
Computed Employer Rate after FFC Offset	12.98 %

Member statutory contributions of 5% to the Annuity Savings Fund are not payable during all periods of covered employment. The rate shown is the equivalent rate if paid during all covered employment.

COMMENT

The Employer Normal Cost (27.22% of covered payroll) would be the rate without recognition of the excess of recognized assets over accrued liabilities (the Full Funding Credit).

ACTUARIAL ACCRUED LIABILITIES AS OF JUNE 30, 2001

Present Value, June 30	Amount
Accrued Pension Liabilities	
Retirees and beneficiaries	\$2,241,443,403
Inactive members future deferred pensions	5,530,247
Active members	837,650,435
Total accrued pension liabilities	3,084,624,085
Pension fund balances	3,521,396,395
Unfunded accrued pension liabilities (Full funding credit)	\$ (436,772,310)
Accrued Annuity Liabilities	
Retirees and beneficiaries	
Future annuities	\$ 9,094,529
Contingency reserve	4,880,831 *
Total	\$ 13,975,360
Members annuities & future refunds	364,648,948
Total accrued annuity liabilities	378,624,308
Annuity fund balances	378,624,308
Unfunded accrued annuity liabilities	\$ 0
System Totals	
Actuarial accrued liabilities	\$3,463,248,393
Accrued assets	3,900,020,703
Unfunded actuarial accrued liabilities (Full funding credit)	\$ (436,772,310)

* See comment on page 12.

VALUATION RESULTS - COMPARATIVE STATEMENT
-- \$ IN MILLIONS --

June 30	Active Payroll		Actuarial Accrued Liabilities			Unfunded / Active Pays	Employer Contributions % of Pays
	Total	Average	Computed Total	Valuation Assets	Unfunded		
1975	\$ 121.5	\$16,670	\$1,107.2	\$ 369.8	\$ 737.4	6.1	53.82%
1976	128.6	19,753	1,240.3	416.0	824.3	6.4	57.49%
1977	134.6	20,012	1,257.9	461.6	796.3	5.9	57.09%
1978	165.0	22,467	1,426.7	531.5	895.2	5.4	56.43%
1979	175.2	25,136	1,557.7	603.2	954.5	5.5	57.54%
1980	178.0	27,992	1,809.0	689.7	1,119.3	6.3	60.35%
1981	155.8	28,429	1,777.8	771.0	1,006.8	6.5	60.95%
1982(a)*	155.4	28,332	1,841.1	864.1	914.8	6.1	58.25%
1983	153.3	28,450	1,810.5	979.7	830.8	5.4	56.95%
1984(a)	148.2	28,455	1,887.2	1,090.2	797.0	5.4	58.16%
1985(a)	171.4	30,302	2,076.4	1,208.3	868.1	5.1	54.66%
1986	185.3	29,220	2,171.5	1,378.5	793.0	4.3	50.21%
1987	202.3	30,906	2,238.2	1,557.0	681.2	3.4	44.69%
1988	206.1	33,120	2,386.0	1,705.4	680.6	3.3	45.71%
1989(a)	208.4	33,179	2,327.9	1,848.9	479.0	2.3	36.52%
1990*	221.5	36,874	2,453.6	2,037.4	416.2	1.9	35.98%
1991	213.1	39,182	2,517.2	2,085.5	431.7	2.0	36.19%
1992(a)*	205.7	39,095	2,345.9	2,163.8	182.1	0.9	27.83%
1993(a)	204.3	38,846	2,493.2	2,256.0	237.2	1.2	28.97%
1994	199.7	38,693	2,486.2	2,304.4	181.8	0.9	27.64%
1995(a)	209.7	39,692	2,574.2	2,443.0	131.2	0.6	25.90%
1996	212.7	39,965	2,633.4	2,628.6	4.8	0.0	21.81%
1997(b)	217.6	40,145	2,724.1	2,944.2	(220.1)	-	7.32%
1998*	217.5	40,772	2,976.8	3,325.9	(349.1)	-	26.16%#
1999@	216.0	40,542	3,274.1	3,668.4	(394.3)	-	26.17%#
2000*	237.7	43,376	3,342.1	3,964.2	(622.1)	-	27.25%#
2001	253.3	45,353	3,463.2	3,900.0	(436.8)	-	27.22%#

(a) After changes in actuarial assumptions.

(b) After changes in actuarial assumptions and a temporary full funding credit.

* Plan amended.

Employer normal cost before full funding credit.

@ After \$55.4 million reserve for 1998-99 13th check and ASF distributions.

SOLVENCY TESTS

The PFRS funding objective is to meet long-term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will pay all promised benefits when due -- the ultimate test of financial soundness. Testing for level contribution rates is *the long-term solvency test*.

A short-term solvency test is one means of checking a system's progress under its funding program. In a short-term solvency test, the plan's present assets (cash and investments) are compared with:

- 1) Active member contributions on deposit;
- 2) The liabilities for future benefits to present retired lives;
- 3) The liabilities for service already rendered by active members.

In a system that has been following the discipline of level percent-of-payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 3) will often be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the System.

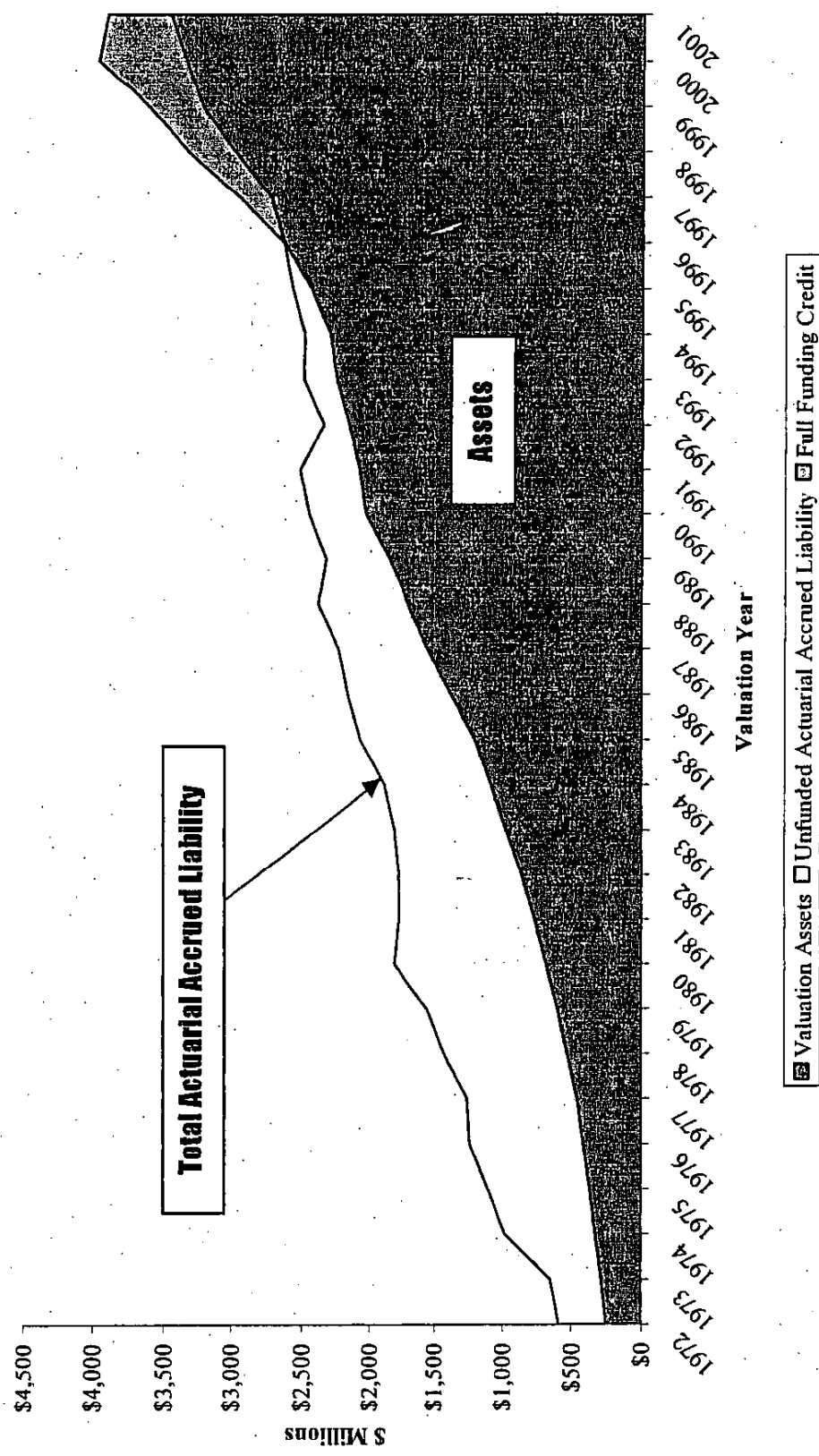
Short-Term Solvency Test 5 Year Comparative Statement (\$ millions)

June 30	Actuarial Accrued Liabilities			Assets	Portion of Accrued Liabilities Covered by Assets			
	(1) Active Member Contr.	(2) Retirees and Benef.	(3) Present Members (Employer Financed Portion)		(1)	(2)	(3)	Total
	1997(a)	\$187	\$1,918		\$ 715	\$2,944	100%	100%
1998*	187	1,979	811	3,326	100%	100%	143%	112%
1999	205	2,035	1,034	3,668	100%	100%	138%	112%
2000*	283	2,192	867	3,964	100%	100%	172%	119%
2001	365	2,255	843	3,900	100%	100%	152%	113%

(a) After changes in actuarial assumptions and benefit provision changes.

* After changes in benefit provisions.

ASSETS AND ACCRUED LIABILITIES



**DERIVATION OF EXPERIENCE GAIN (LOSS)
YEAR ENDED JUNE 30, 2001**

Actual experience will never (except by coincidence) coincide exactly with assumed experience. Gains and losses will often cancel each other over a period of years, but sizable year to year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below.

(1) UAAL* at start of year	\$(622,107,920)
(2) Normal cost from last valuation	64,784,575
(3) Actual employer contributions	14,443,382
(4) Interest accrual: (1) x .078	(48,524,418)
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	(620,291,145)
(6) Change due to benefit provision modifications	0
(7) Change due to revised actuarial assumptions	0
(8) Expected UAAL after changes: (5) + (6) + (7)	(620,291,145)
(9) Actual UAAL at end of year	(436,772,310)
(10) Experience gain (loss): (8) - (9)	(183,518,835)
(11) Experience gain (loss) as a % of beginning of year accrued liability	(5.5)%

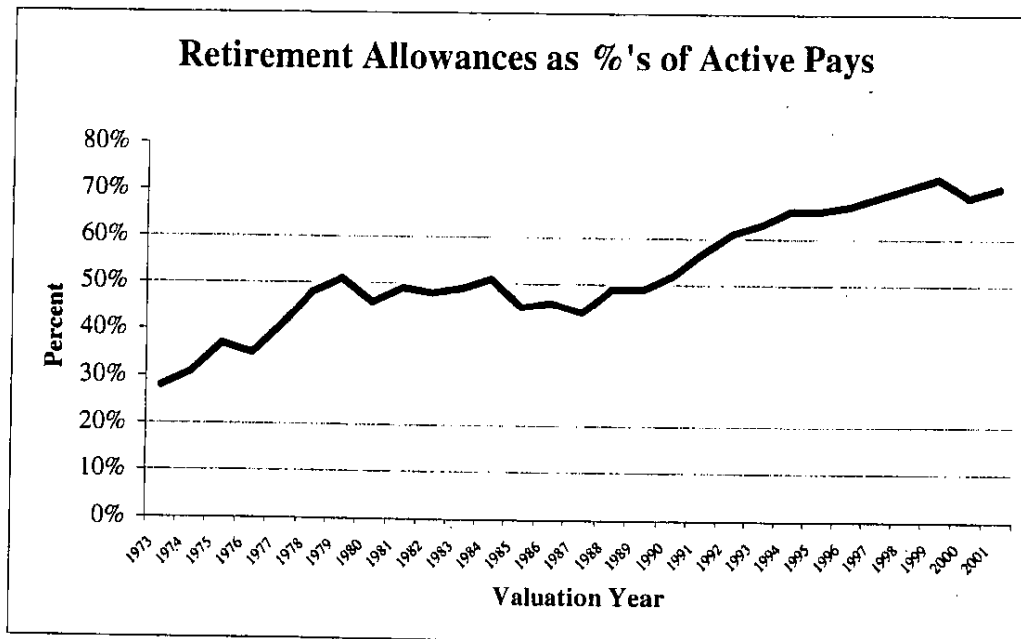
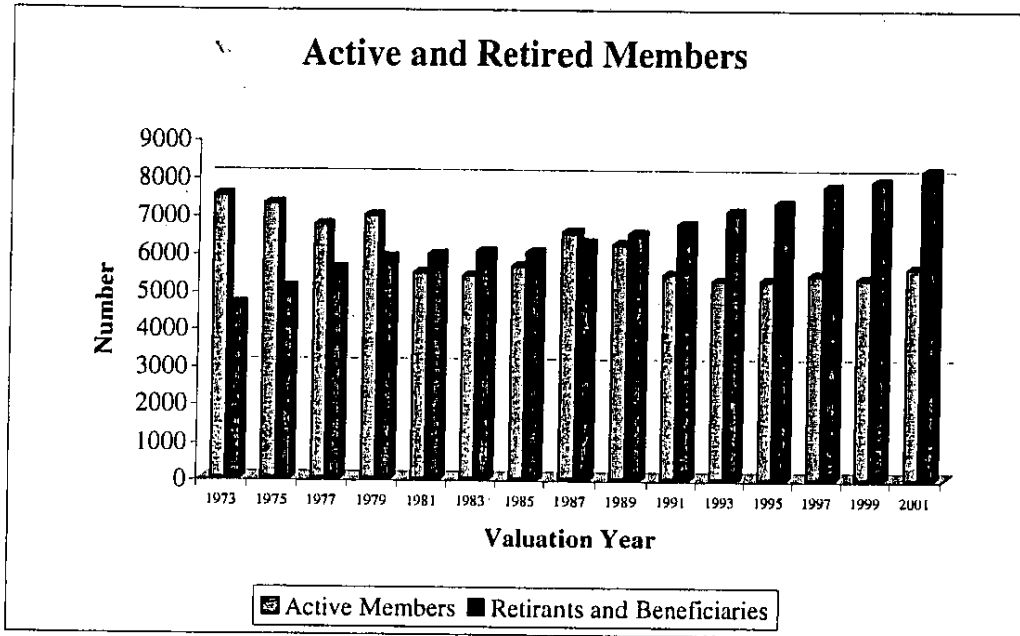
* *Unfunded actuarial accrued liability.*

**COMPARATIVE STATEMENT OF ACTIVE MEMBERS
AND VALUATION PAYROLL**

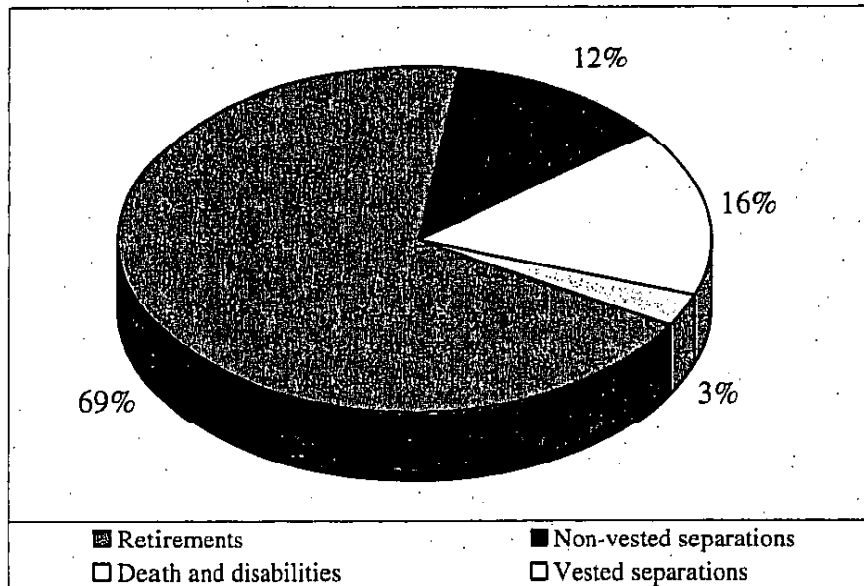
June 30	No. Members		Total Members					
	1969 Plan	Pre- 1969	No.	% Change	Ratio of Active to Retired	Annual Payroll	Average Pay	
							\$	Change
1973	2,796	4,712	7,508	2 %	1.6	\$101,084,327	\$13,463	7.1 %
1974	3,065	4,291	7,356	(2)%	1.5	112,925,940	15,352	14.0 %
1975	3,298	3,993	7,291	(1)%	1.4	121,540,470	16,670	8.6 %
1976	2,900	3,610	6,510	(11)%	1.2	128,594,291	19,753	18.5 %
1977	3,463	3,265	6,728	3 %	1.2	134,639,135	20,012	1.3 %
1978	4,432	2,911	7,343	9 %	1.3	164,975,236	22,467	12.3 %
1979	4,230	2,739	6,969	(5)%	1.2	175,174,674	25,136	11.9 %
1980	3,719	2,640	6,359	(9)%	1.1	178,004,349	27,993	11.4 %
1981	2,991	2,491	5,482	(14)%	0.9	155,849,804	28,429	1.6 %
1982	3,185	2,299	5,484	0 %	0.9	155,372,732	28,332	(0.3)%
1983	3,176	2,214	5,390	(2)%	0.9	153,347,716	28,450	0.4 %
1984	3,070	2,139	5,209	(3)%	0.9	148,223,416	28,455	0.0 %
1985	3,657	1,998	5,655	9 %	0.9	171,357,741	30,302	6.5 %
1986	4,463	1,879	6,342	12 %	1.0	185,312,563	29,220	(3.6)%
1987	4,918	1,627	6,545	3 %	1.0	202,277,028	30,906	5.8 %
1988	4,776	1,447	6,223	(5)%	1.0	206,107,980	33,120	7.2 %
1989	4,942	1,338	6,280	1 %	1.0	208,361,567	33,179	0.2 %
1990	4,834	1,174	6,008	(4)%	0.9	221,538,387	36,874	11.1 %
1991	4,372	1,066	5,438	(9)%	0.8	213,072,553	39,182	6.3 %
1992	4,411	850	5,261	(3)%	0.8	205,681,412	39,095	(0.2)%
1993	4,534	725	5,259	0 %	0.7	204,289,195	38,846	(0.6)%
1994	4,578	584	5,162	(2)%	0.7	199,734,550	38,693	(0.4)%
1995	4,779	505	5,284	2 %	0.7	209,733,734	39,692	2.6 %
1996	4,889	432	5,321	1 %	0.7	212,656,401	39,965	0.7 %
1997	5,049	371	5,420	2 %	0.7	217,585,229	40,145	0.5 %
1998	5,018	316	5,334	(2)%	0.7	217,479,443	40,772	1.6 %
1999	5,099	230	5,329	0 %	0.7	216,049,687	40,542	(0.6)%
2000	5,291	190	5,481	3 %	0.7	237,741,560	43,376	7.0 %
2001	5,453	132	5,585	2 %	0.7	253,297,027	45,353	4.6 %

**COMPARATIVE STATEMENT OF ANNUAL RETIREMENT ALLOWANCES
BEING PAID RETIREES AND BENEFICIARIES**

June 30	No. Retired		% of Current Allowances			Current Allowances		Allowances as a % of Payroll
	Pre-69	Total	Annuities	Pensions	Escalators	Total	Average	
1973	4,626	4,626	5.2%	56.2%	38.6%	\$ 28,461,146	\$ 6,152	28%
1974	4,873	4,873	4.7%	51.3%	44.0%	34,888,040	7,159	31%
1975	5,075	5,075	4.0%	48.3%	47.7%	41,808,416	8,238	34%
1976	5,325	5,325	3.5%	48.1%	48.4%	47,479,044	8,916	37%
1977	5,576	5,576	3.2%	52.0%	44.8%	51,040,761	9,154	38%
1978	5,760	5,760	2.8%	44.2%	53.0%	58,117,007	10,090	35%
1979	5,869	5,869	2.6%	51.3%	46.1%	61,355,273	10,454	35%
1980	5,676	5,911	2.1%	45.3%	52.6%	72,671,386	12,294	41%
1981	5,691	5,951	2.0%	46.7%	51.3%	74,565,233	12,530	48%
1982	5,709	6,006	2.0%	49.0%	49.0%	75,348,490	12,545	48%
1983	5,705	6,038	2.0%	50.8%	47.2%	75,774,552	12,550	49%
1984	5,641	5,986	1.9%	51.7%	46.4%	76,126,476	12,717	51%
1985	5,581	6,011	1.9%	54.0%	44.1%	70,776,660	12,773	45%
1986	5,585	6,117	1.6%	52.5%	45.9%	85,409,280	13,962	46%
1987	5,486	6,264	1.5%	53.5%	45.0%	88,608,492	14,146	44%
1988	5,442	6,416	1.3%	53.9%	44.8%	100,659,780	15,689	49%
1989	5,415	6,496	1.3%	55.7%	43.0%	103,122,696	15,875	49%
1990	5,412	6,660	1.1%	54.3%	44.6%	114,650,196	17,215	52%
1991	5,361	6,754	1.1%	54.3%	44.6%	121,715,028	18,021	57%
1992	5,342	6,899	1.0%	57.0%	42.0%	124,835,208	18,095	61%
1993	5,349	7,091	1.0%	59.5%	39.5%	129,027,970	18,196	63%
1994	5,249	7,169	0.9%	61.7%	37.4%	131,595,379	18,356	66%
1995	5,161	7,311	0.9%	61.3%	37.8%	138,959,417	19,007	66%
1996	5,049	7,469	0.8%	62.6%	36.6%	143,536,485	19,218	67%
1997	5,012	7,743	0.8%	63.3%	35.9%	150,843,744	19,481	69%
1998	4,719	7,750	0.7%	65.8%	33.5%	154,226,437	19,900	71%
1999	4,573	7,883	0.7%	68.4%	30.9%	158,523,816	20,110	73%
2000	4,498	8,079	0.6%	70.0%	29.4%	164,279,376	20,334	69%
2001	4,394	8,166	0.6%	67.4%	32.0%	180,239,652	22,072	71%



EXPECTED TERMINATIONS FROM ACTIVE EMPLOYMENT FOR CURRENT ACTIVE MEMBERS



The chart shows the expected future development of the present population in simplified terms. The retirement system presently covers 5,585 active members. Eventually, 685 people are expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 3,996 people are expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 904 people are expected to become eligible for death-in-service or disability benefits.

COMMENTS

Experience During the Past Year

During the year ended June 30, 2001, overall Retirement System experience was less favorable than assumed, as shown in the gain/loss schedule on page 7. The poor experience was primarily attributable to recognized investment income which was lower than assumed. The funding value rate of return was 4.2%. Even with this year's experience loss, the actuarial value of assets exceeded actuarial accrued liabilities by \$437 million as of June 30, 2001. On a market value basis, experience was even less favorable (see page 16). The ratio of the market value of assets to accrued liabilities is 100.6%. Market returns in the near term exceeding the assumed rate of return will be necessary for the System to remain fully funded.

Annuity Reserve Fund

The contingency reserve in the Annuity Reserve Fund is \$4.9 million and the ratio of the ARF balance to computed liabilities is over 150% (see page 3). The size of the contingency is likely to increase further unless a balance is restored – either by means of: (i) an increase in annuities, (ii) a transfer to another reserve fund, (iii) a suspension of future interest credits, or (iv) some combination of (i), (ii) and (iii).

Overall Financial Condition

The Retirement System continues in excellent actuarial condition in accordance with the principles of level percent-of-payroll financing.

DATA FURNISHED FOR VALUATION



SUMMARY OF BENEFIT PROVISIONS (JULY 1, 2001)

Age and Service Retirement

Eligibility - 25 years of service regardless of age.

Annual Amount - An annuity equal to the actuarial equivalent of the member's accumulated contribution account plus a defined benefit, which, when added to the annuity will provide the following:

Pre-1969 Members - 2.5% of AFC times the first 25 years of service, with a maximum allowance of 15/22 of a police officer's or firefighter's annual rate of compensation.

1969 Plan Members - 2.5% of AFC times the first 25 years of service plus 2.1% of AFC times each of the next 10 years of service.

Members may elect to receive their accumulated contribution account in a lump sum after 25 years of service. The defined benefit at retirement is then reduced by the actuarial equivalent of the amount of principal withdrawn. No reduction is made with regard to the interest portion of the withdrawal.

Pre-1969 plan members may elect 1969 plan benefits at the time of retirement.

Type of Average Final Compensation (AFC) - Average of the current compensation for the ranks held in each of last 5 years. Pension benefits for non-union employees may not be diminished due to a reduction in compensation because of fiscal emergency. AFC includes prior longevity distributions during the averaging period in accordance with the following schedule: 1% of compensation after 5 years of service, 2% after 11 years, 3% after 16 years and 4% after 21 years.

Deferred Retirement (vested benefit)

Eligibility - Age 40 with 8 years of service.

Annual Amount - Same as regular retirement but based on average final compensation and credited service at the time of termination.

Benefit Commencement - *members hired prior to 7/1/85*: Unreduced benefit begins at the age when the member would have first been eligible for regular retirement had the member continued in City service. *Members hired after 6/30/85*: Unreduced benefit begins at age 62. All members may elect a reduced benefit payable immediately.

Duty Disability Retirement

Eligibility - No age or service requirement.

Annual Amount - A basic benefit of 50% of final compensation and a supplemental benefit of 16-2/3% of final compensation is payable for 24 months. After 24 months, members disabled from any occupation continue to receive both benefits; otherwise, only the 50% benefit is then payable. Upon attaining 25 years of service, the disability benefit is 50% of final compensation. Members convert to regular retirement benefit at age 65. Worker's compensation payments are offset. Members who have already filed under old duty disability plan will receive 66-2/3% of final compensation payable to eligibility date for regular retirement.

SUMMARY OF BENEFIT PROVISIONS (CONTINUED)

Non-Duty Disability Retirement

Eligibility - 5 years of service.

Annual Amount - Computed as a regular retirement benefit, but based on average final compensation and credited service at the time of disability. Minimum benefit is 20% of average final compensation.

Duty Death Before Retirement

Eligibility - No age or service requirement.

Annual Amount - Surviving spouse receives 5/11 of a police officer's or firefighter's compensation and each child under age 18 receives 1/10 of such compensation with a maximum total of 7/33 of such compensation. If there is no surviving spouse, each child receives 1/4 of such compensation with a maximum total of 1/2 of such compensation. If there is no surviving spouse or children, each dependent parent receives 1/6 of such compensation. Worker's compensation payments are offset.

Non-Duty Death Before Retirement

Eligibility - No age or service requirement.

Annual Amount - Same as a regular retirement benefit to a surviving spouse, but reduced in accordance with a 100% joint and survivor option election. Minimum benefit is 20% of average final compensation. Each child under 18 receives 1/7 of a police officer's or firefighter's compensation with a maximum total of 2/7 of such compensation. If there is no spouse or children, each dependent parent receives 1/7 of such compensation.

Post-Retirement Cost-of-Living Adjustments

Pre-1969 Members - Allowances increase in proportion to active member compensation for the corresponding rank.

1969 Plan Members - *For Police and Fire Supervisory and Command groups who retire on or after 7/1/98:* Pensions increase by 2.25% of the **current** pension amount each July 1.

Others: Pensions increase by 2.25% of the **original** pension amount each July 1.

Member Contributions

5% of covered compensation payable until first eligible for regular retirement.

ASSET INFORMATION FURNISHED FOR VALUATION

Reserve Accounts

Funds	Fund Balances	
	June 30, 2001	June 30, 2000
Annuity Savings	\$ 364,648,948	\$ 283,413,612
Annuity Reserve	13,975,360	25,057,751
Total Annuity Funds	378,624,308	308,471,363
Pension Accumulation	1,249,672,365	1,562,716,723
Pension Reserve	2,241,443,403	2,061,672,393
Survivor Benefit	30,280,627	31,370,991
Total Pension Funds	3,521,396,395	3,655,760,107
Total Fund Balances	\$3,900,020,703	\$3,964,231,470

Revenues and Expenditures

	2000-2001	1999-2000
Balance - June 30	\$3,964,231,470	\$3,668,362,979
Revenues		
Employees' contributions	10,300,781	8,670,002
Employer contributions	14,443,382	19,972,058
Recognized investment income	163,444,827	524,723,871
Total	188,188,990	553,365,931
Expenditures		
Regular benefit payments	179,212,275	170,265,388
13th Check payments	52,273,480	57,100,000
Withdrawal of member contributions	17,766,305	26,475,389
Administrative expenses	3,147,697	3,656,663
Total	252,399,757	257,497,440
Balance - June 30	\$3,900,020,703	\$3,964,231,470
Ratio of Net Investment Income to Mean Assets	4.2%	14.6%

DEVELOPMENT OF FUNDING VALUE OF ASSETS

	1999	2000	2001	2002	2003
A. Funding Value Beginning of Year	\$3,325,929,721	\$3,668,362,979	\$3,964,231,470		
B. Market Value End of Year	3,807,897,364	4,175,946,568	3,483,625,219		
C. Market Value Beginning of Year	3,639,071,927	3,807,897,364	4,175,946,568		
D. Contributions During Year					
D1. City Contributions (End of Year)	24,236,035	28,642,060	14,443,382		
D2. Member Contributions	#	#	10,300,781		
E. Benefits Paid During Year	180,310,075	253,840,778	249,252,060		
F. Investment Income					
F1. Market Total: B - C - D + E	324,899,477	593,247,921	(467,813,451)		
F2. Amount for Immediate Recog(A-E/2+D2/2)x.078 or actual	270,990,482	302,629,774	302,088,849		
F3. Amount for Phased-In Recognition: F1-F2	53,908,995	290,618,147	(769,902,300)		
G. Phased-In Recognition of Investment Income					
G1. Current Year: F3/3	17,969,665	96,872,716	(256,634,100)		
G2. 1st Prior Year:	103,595,055	17,969,665	96,872,716	\$(256,634,100)	
G3. 2nd Prior Year:	105,952,094	103,595,055	17,969,665	96,872,716	\$(256,634,100)
G4. Total Recognized Investment Gain	227,516,815	218,437,436	(141,791,719)	(159,761,384)	(256,634,100)
H. Total Interest Distributed - Current Year (F2 + G4)	498,507,297	521,067,210	160,297,130		
I. Funding Value End of Year: A + D - E + H	3,668,362,979	3,964,231,470	3,900,020,703		
J. Difference Between Market & Funding Value (B - I)	139,534,386	211,715,097	(416,395,484)		
K. Recognized Rate of Return: H / [1/2 (A + I - H)]	15.4%	14.6%	4.2%		
L. Market Rate of Return: F1 / [C - 1/2 (E)]	8.7%	15.0%	(11.5)%		

Included in D1.

The Funding Value of Assets recognizes assumed investment income (line F2) fully each year. Differences between actual and assumed investment income (line F3) are phased in over a closed 3 year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. The Funding Value of Assets is unbiased with respect to Market Value. At any time it may be either greater or less than Market Value. If assumed rates are exactly realized for 2 consecutive years, the Funding Value will become equal to Market Value.

**RETIREES AND BENEFICIARIES JUNE 30, 2001
TABULATED BY ATTAINED AGE**

Attained Age	Age & Service		Disability		Death-in-Service		Totals	
	No.	Monthly Allowances	No.	Monthly Allowances	No.	Monthly Allowances	No.	Monthly Allowances
Under 20*	6	\$ 6,600			71	\$ 35,749	77	\$ 42,349
20-24	1	500	1	\$ 2,043			2	2,543
25-29	2	2,155	2	4,973	2	1,433	6	8,561
30-34	2	3,406	19	44,882	2	2,626	23	50,914
35-39	4	4,415	85	197,009	7	9,458	96	210,882
40-44	38	27,676	97	216,172	16	17,426	151	261,274
45-49	228	322,717	241	527,524	28	28,518	497	878,759
50-54	795	1,438,680	527	1,010,939	49	64,349	1,371	2,513,968
55-59	837	1,598,890	383	706,418	37	49,448	1,257	2,354,756
60-64	633	1,327,442	178	325,465	27	36,313	838	1,689,220
65-69	496	969,847	92	180,960	19	31,048	607	1,181,855
70-74	810	1,554,176	164	316,730	49	75,072	1,023	1,945,978
75-79	944	1,706,645	169	322,489	50	78,429	1,163	2,107,563
80-84	548	922,335	79	161,410	27	40,408	654	1,124,153
85-89	267	444,284	13	27,668	15	23,539	295	495,491
90-94	75	106,651	0	0	3	4,892	78	111,543
95 & Over	27	38,439			1	1,723	28	40,162
Totals	5,713	\$10,474,858	2,050	\$4,044,682	403	\$500,431	8,166	\$15,019,971

* May include records with defective birth dates.

**INACTIVE VESTED MEMBERS JUNE 30, 2001
TABULATED BY ATTAINED AGE**

Attained Age	No.	Estimated Annual Allowances
40-44	4	\$ 83,604
45-49	12	191,172
50-54	16	196,236
55-59	9	94,092
Totals	41	\$565,104

PRE 1969 RETIREES AND BENEFICIARIES JUNE 30, 2001
TABULATED BY ATTAINED AGE

Attained Age	Age & Service		Disability		Death-in-Service		Totals	
	No.	Monthly Allowances	No.	Monthly Allowances	No.	Monthly Allowances	No.	Monthly Allowances
Under 20*	5	\$ 5,346			3	\$ 2,032	8	\$ 7,378
20-24			1	\$ 2,043			1	2,043
25-29								
30-34	1	884					1	884
35-39								
40-44	4	2,791					4	2,791
45-49	4	4,829			2	3,110	6	7,939
50-54	54	77,867	19	34,674	12	18,405	85	130,946
55-59	303	494,486	160	289,277	19	30,047	482	813,810
60-64	365	645,125	132	235,082	23	30,393	520	910,600
65-69	334	581,734	74	131,004	14	20,942	422	733,680
70-74	581	1,020,518	146	276,472	46	68,059	773	1,365,049
75-79	843	1,466,338	162	306,122	49	76,869	1,054	1,849,329
80-84	541	908,960	78	159,182	25	38,697	644	1,106,839
85-89	263	441,033	13	27,668	15	23,539	291	492,240
90-94	72	103,665			3	4,892	75	108,557
95 & Over	27	38,439			1	1,723	28	40,162
Totals	3,397	\$5,792,015	785	\$1,461,524	212	\$318,708	4,394	\$7,572,247

* May include records with defective birth dates.

ACTIVE MEMBERS JUNE 30, 2001
BY ATTAINED AGE AND YEARS OF SERVICE

Police Members

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
Under 20	5							5	\$ 143,850
20-24	370	2						372	12,127,948
25-29	574	162						736	27,733,603
30-34	404	302	66	2				774	32,150,739
35-39	146	130	205	128	0			609	27,700,426
40-44	55	48	124	227	8	1		463	22,277,933
45-49	9	15	65	267	102	82	7	547	27,725,522
50-54	5	3	16	108	60	210	98	500	26,645,015
55-59	3		2	24	19	61	75	184	9,599,176
60				1		5	8	14	726,442
61						1	6	7	398,676
62						2	10	12	647,296
63							3	3	173,476
64							2	2	90,976
65							1	1	82,500
66							3	3	165,123
79							1	1	45,488
Totals	1,571	662	478	757	189	362	214	4,233	\$188,434,189

Fire Members

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
Under 20									
20-24	50							50	\$ 1,589,102
25-29	112	20	1					133	4,698,202
30-34	88	93	66	4				251	10,752,389
35-39	30	48	134	31				243	11,118,839
40-44	10	20	68	60	25	1		184	8,987,778
45-49	1	4	26	33	69	23	2	158	8,251,929
50-54			2	11	38	122	34	207	11,669,442
55-59			2	2	7	29	84	124	7,638,132
60							2	2	157,025
Totals	291	185	299	141	139	175	122	1,352	\$ 64,862,838

TOTAL ACTIVE MEMBERS JUNE 30, 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
Under 20	5							5	\$ 143,850
20-24	420	2						422	13,717,050
25-29	686	182	1					869	32,431,805
30-34	492	395	132	6				1025	42,903,128
35-39	176	178	339	159				852	38,819,265
40-44	65	68	192	287	33	2		647	31,265,711
45-49	10	19	91	300	171	105	9	705	35,977,451
50-54	5	3	18	119	98	332	132	707	38,314,457
55-59	3		4	26	26	90	159	308	17,237,308
60				1		5	10	16	883,467
61						1	6	7	398,676
62						2	10	12	647,296
63							3	3	173,476
64							2	2	90,976
65							1	1	82,500
66							3	3	165,123
79							1	1	45,488
Totals	1,862	847	777	898	328	537	336	5585	\$253,297,027

	Group Averages		
	Police	Fire	Total
Age:	37.7 years	40.5 years	38.4 years
Service:	11.4 years	14.8 years	12.2 years
Annual Pay:	\$44,516	\$47,975	\$45,353

**ACTUARIAL DISCLOSURES
REQUIRED BY STATEMENT NO. 25
OF THE GOVERNMENTAL ACCOUNTING BOARD**



GASB STATEMENT NO. 25 REQUIRED SUPPLEMENTARY INFORMATION

Actuarial Valuation Date	Actuarial Value of Assets (a)	Schedule of Funding Progress			Covered Payroll (c)	UAAL as % of Covered Payroll ((b - a) / c)
		Actuarial Accrued Liability (AAL) -- Entry Age (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)		
1992*#	\$2,163,797,445	\$2,345,918,889	\$182,121,444	92.2 %	\$205,681,412	88.5 %
1993#	2,255,955,423	2,493,225,379	237,269,956	90.5 %	204,289,195	116.1 %
1994	2,304,360,431	2,486,218,878	181,858,447	92.7 %	199,734,550	91.1 %
1995#	2,443,016,319	2,574,189,310	131,172,991	94.9 %	209,733,734	62.5 %
1996	2,628,627,790	2,633,394,644	4,766,854	99.8 %	212,656,401	2.2 %
1997#	2,944,208,105	2,820,330,323	(123,877,782)	104.4 %	217,585,229	-
1998#*	3,325,929,721	2,976,770,662	(349,159,059)	111.7 %	217,479,443	-
1999	3,668,362,979	3,274,050,127	(394,312,852)	112.0 %	216,049,687	-
2000*	3,964,231,470	3,342,123,550	(622,107,920)	118.6 %	237,741,560	-
2001	3,900,020,703	3,463,248,393	(436,772,310)	112.6 %	253,297,027	-

* Plan amended.

After changes in actuarial assumptions.

SCHEDULE OF EMPLOYER CONTRIBUTIONS

Fiscal Year Ended June 30	Actual Contribution	Contribution as Percent of Valuation Payroll #	Percentage Contributed
1994	\$54,898,990	27.83%	100%
1995	57,328,033	28.97%	100%
1996	55,010,539	27.64%	100%
1997	54,572,561	25.90%	100%
1998	48,120,578	21.81%	100%
1999	15,709,799	7.32%	100%
2000	19,972,058	9.18%*	100%
2001	14,443,382	6.69%*	100%

* Estimated.

Valuation payroll in second prior year.

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:	June 30, 2001
Actuarial cost method	Entry Age
Amortization method	Level percent
Remaining amortization period	16 years
Asset valuation method	3 year smoothed market

Actuarial assumptions:

Investment rate of return	7.8%
Projected salary increases*	5.5% - 9.0%
*Includes inflation at	4.8%

Cost-of-living adjustments

Pre-1969 Plan Members: Allowances increase in proportion to active member compensation for corresponding rank.

1969 Plan Members: Pensions increase by 2.25% of current pension amount each July 1 for supervisory and command groups and 2.25% of original pension amount for all others.

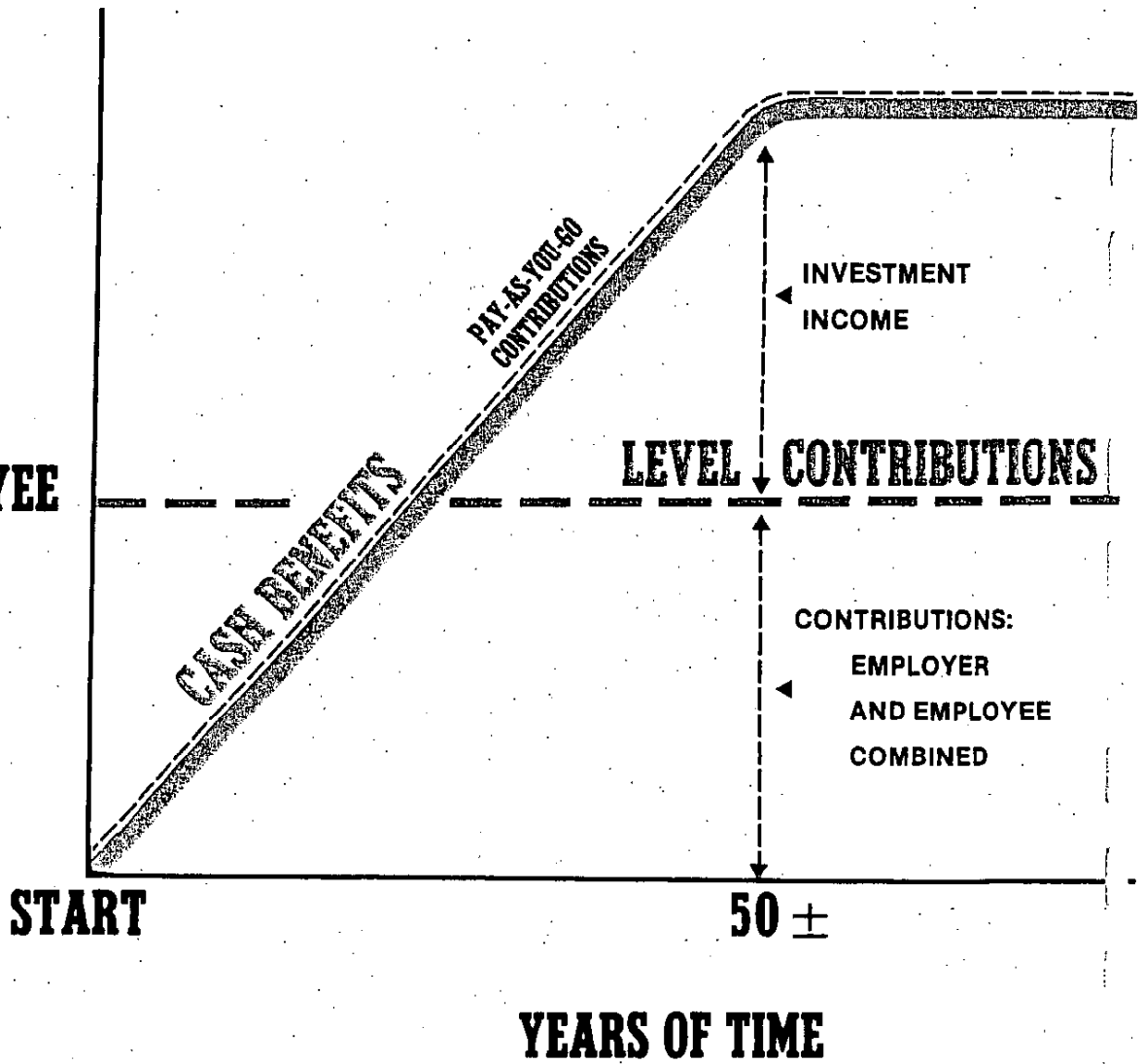
Membership of the plan consisted of the following at June 30, 2001, the date of the latest actuarial valuation:

Retirees and beneficiaries receiving benefits	8,166
Terminated plan members entitled to but not yet receiving benefits	41
Active plan members	5,585
Total	13,792

FINANCIAL PRINCIPLES



**% OF
ACTIVE
EMPLOYEE
PAYS**



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

Economic Risk Areas

- Rates of investment return
- Rates of pay increase
- Changes in active member group size

Non-Economic Risk Areas

- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

THE ACTUARIAL VALUATION PROCESS

The financing diagram on the opposite page shows the relationship between two different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (as in the Federal Social Security program) is an *increasing contribution method*; and the *level contribution method* which seeks to balance contributions between generations.

The actuarial valuation is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. *Member Census Data:*

- Retired lives now receiving benefits
- Former members with vested benefits
- Active members

B. *Benefit provisions* that establish eligibility and amounts of payments to members

C. *Asset Data* (cash & investments)

D. *Assumptions concerning future experience in various risk areas*, which are established by the Board of Trustees and the City Council after consulting with the actuary

E. *The funding method* for employer contributions (the long-term, planned pattern for employer contributions)

F. *Mathematically combining the assumptions, the funding method, and the data*

G. *Determination of:*

- Plan Financial position and
- New Employer Contribution Rate

BASIC FINANCIAL OBJECTIVE AND OPERATION OF THE RETIREMENT SYSTEM

Benefit Promises Made Which Must Be Paid For. A retirement program is an orderly means of handing out, keeping track of, and financing contingent pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit they are, in effect, handed an "IOU" which reads: **"The Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire."**

The principal related financial question is: When shall the money required to cover the "IOU" be contributed? This year, when the benefit of the member's service is received? Or, some future year when the "IOU" becomes a cash demand?

The Constitution of the State of Michigan is directed to the question:

"Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities."

This retirement system meets this constitutional requirement by having the following *Financial Objective: To establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level* from year to year and will not have to be increased for future generations of taxpayers.

Translated into actuarial terminology, a level percent-of-payroll contribution objective means that the contribution rate must be at least:

Normal Cost (the value of benefits likely to be paid which is assigned to service being rendered in the current year)

... plus ...

Interest on the Unfunded Actuarial Accrued Liability (the difference between the actuarial accrued liability and current system assets).

If contributions to the retirement program are less than the preceding amount, the difference, plus investment earnings not realized thereon, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate; that is:

$$B = C + I - E$$

Benefit payments to any group of members and their beneficiaries cannot exceed the sum of:

Contributions received over time on behalf of the group

... plus ...

Investment earnings on contributions received and not required for immediate payment of benefits

... minus ...

Expenses incurred in operating the program.

There are retirement programs designed to defer the bulk of contributions far into the future. Contributions in early years are low, but the inevitable consequence is a relentlessly increasing contribution rate – to a level greatly in excess of the level percent of payroll rate. *This method of financing is prohibited in Michigan by the state constitution.*

A by-product of the level percent-of-payroll contribution objective is the accumulation of invested assets for varying periods of time. Investment income becomes the major contributor to the retirement program, and the amount is directly related to the amount of past contributions and investment performance.

Computed Contribution Rate Needed To Finance Benefits. From a given schedule of benefits and from the data furnished, the contribution rate is calculated *by means of an actuarial valuation* – the technique of assigning monetary values to the risks assumed in operating a retirement program.

APPENDIX



**SUMMARY OF ASSUMPTIONS USED FOR DPFERS ACTUARIAL VALUATION
ASSUMPTIONS ADOPTED BY BOARD OF TRUSTEES
AFTER CONSULTING WITH ACTUARY**

ECONOMIC ASSUMPTIONS

The investment return rate used in the valuation was 7.8% per year, compounded annually (net after administrative expenses). The real rate of return is the portion of total investment return which is more than the inflation rate. Considering other financial assumptions, the 7.8% total investment return rate translates to an assumed real rate of return of 3%.

Pay increase assumptions for individual active members are shown on page 27. Part of the assumption for each age is for a merit and/or seniority increase, and the other 4.8% recognizes wage inflation.

Total active member payroll is assumed to increase 4.8% annually, which is the portion of the individual pay increase assumptions attributable to wage inflation.

NON-ECONOMIC ASSUMPTIONS

The number of active members is assumed to continue at the present number.

The mortality table used to measure retired life mortality was 90% of the 1983 Group Annuity Mortality Table. Related values are shown on page 27. This table was first used for the June 30, 1998 valuation.

The probabilities of age/service retirement for members eligible to retire are shown in on page 28. These probabilities were last revised for the June 30, 1998 valuation.

The probabilities of separation from service (including *death-in-service*) are shown for sample ages on page 28. These probabilities were last revised for the June 30, 1998 valuation.

FUNDING METHODS

The entry age actuarial cost method was used in determining age and service liabilities and normal cost, vesting liabilities and normal cost, and casualty liabilities and normal cost.

Differences between assumed experience and actual experience ("actuarial gains and losses") become part of actuarial accrued liabilities.

Unfunded actuarial accrued liabilities, if any, are amortized over periods of future years to produce contribution amounts (principal & interest) which are level percent of payroll contributions.

Employer contribution dollars were assumed to be paid in a single sum on the last day of the employer fiscal year. (Adopted for the 6-30-79 actuarial valuation.)

Valuation assets recognize investment return above or below the actuarial assumed rate over a three year period. (Adopted for the 6-30-95 actuarial valuation.)

The effect of changes in eligibility for normal retirement due to service purchases was approximated by increasing computed actuarial accrued liabilities by 5%. In addition, active member accrued liabilities were increased by 2% to approximate the effect of incomplete service data.

The data about persons now covered and about present assets were furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the actuary.

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (M.A.A.A.).

SAMPLE SALARY ADJUSTMENT RATES

Ages	Salary Increase Assumptions for an Individual Member		
	Merit & Seniority	Base (Economic)	Increase Next Year
20	4.11%	4.80%	8.91%
25	3.66%	4.80%	8.46%
30	2.27%	4.80%	7.07%
35	1.45%	4.80%	6.25%
40	1.13%	4.80%	5.93%
45	0.86%	4.80%	5.66%
50	0.65%	4.80%	5.45%
Ref			24 + 1.80%

SINGLE LIFE RETIREMENT VALUES BASED ON 1983 GROUP ANNUITY MORTALITY & 7.8% INTEREST

Sample Attained Ages	Present Value of \$1.00 Monthly Increasing "X"% Annually After Retirement						Future Life Expectancy (years)	
	4.8% Compound		2.25% Simple		2.25% Compound		Men	Women
	Men	Women	Men	Women	Men	Women		
45	\$251.08	\$276.66	\$173.68	\$183.84	\$180.93	\$192.80	34.78	40.65
50	229.39	257.20	164.33	176.80	170.22	184.37	30.19	35.86
55	206.16	235.52	153.16	167.82	157.74	173.98	25.79	31.15
60	181.12	211.60	139.67	156.56	143.05	161.34	21.55	26.56
65	154.72	185.69	123.81	142.81	126.15	146.31	17.54	22.13
70	128.80	158.13	106.82	126.42	108.33	128.82	13.96	17.93
75	104.33	130.47	89.48	108.30	90.39	109.81	10.84	14.1
80	82.29	104.80	72.72	90.12	73.24	91.01	8.23	10.84
Ref:	30 x 0.90	31 x 0.90	30 x 0.90	31 x 0.90	30 x 0.90	31 x 0.90		

PROBABILITIES OF SERVICE RETIREMENT

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year
45	25%
46	25%
47	25%
48	22%
49	20%
50	18%
51	15%
52	15%
53	15%
54	15%
55	15%
56	15%
57	15%
58	15%
59	15%
60	40%
61	30%
62	30%
63	30%
64	30%
65	30%
66	30%
67	30%
68	30%
69	30%
70	100%
Ref	537

Sample Ages	Percent of Active Members Separating Within Next Year				
	Death		Disability		Withdrawal
	Men	Women	Non-Duty	Duty	
20	0.02%	0.01%	0.20%	1.13%	9.00%
25	0.02%	0.01%	0.20%	1.13%	6.50%
30	0.03%	0.02%	0.20%	1.13%	4.00%
35	0.04%	0.02%	0.20%	1.13%	2.30%
40	0.06%	0.03%	0.28%	1.13%	0.90%
45	0.11%	0.05%	0.42%	1.13%	0.50%
50	0.20%	0.08%	0.80%	1.13%	0.50%
Ref	30 x 0.5	31 x 0.5	208 x 1.00	209 x 0.90	351

MEANING OF "UNFUNDED ACTUARIAL ACCRUED LIABILITIES"

Actuarial accrued liabilities are the portion of the present value of plan promises to pay benefits in the future not covered by future normal cost contributions.

--- 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.

If actuarial accrued liabilities at any time exceed the plan's accrued assets (cash & investments), the difference is *unfunded actuarial accrued liabilities*. If the plan's assets equal the plan's actuarial accrued liabilities, the plan would be termed "fully funded."

Each time a plan adds a new benefit which applies to service already rendered, an actuarial accrued liability is created. If assets are insufficient to cover the value of the new benefit promises, an additional unfunded actuarial accrued liability is also created. Payment for such unfunded accrued liabilities is generally spread over a period of years, commonly in the 15-30 year range.

Unfunded actuarial accrued liabilities can occur in another way: if actual financial experience is less favorable than assumed financial experience, the difference is added to unfunded actuarial accrued liabilities. For example, during periods of high inflation, unfunded actuarial accrued liabilities generally increase because unexpected rates of pay increase will create additional liabilities which may not be matched by investment performance.

The existence of unfunded actuarial accrued liabilities is not bad, but the changes from year to year in the amount of unfunded actuarial accrued liabilities are important -- "bad" or "good" or somewhere in between.

Unfunded actuarial accrued liabilities do not represent a bill payable immediately, but it is important that policy-makers prevent the amount from becoming unreasonably high and *it is vital that there is a sound method in place for making payments toward them*, so that they are controlled.

GLOSSARY

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan 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 plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

Valuation Assets. The value of current plan assets recognized for valuation purposes.