

**THE POLICE AND FIRE RETIREMENT SYSTEM OF THE  
CITY OF DETROIT**

66TH ANNUAL ACTUARIAL VALUATION  
JUNE 30, 2007

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March 4, 2008

Board of Trustees  
The Police and Fire Retirement System of the City of Detroit

The results of the **66th Annual Actuarial Valuation** of the annuity and pension liabilities of the Police and Fire Retirement System of the City of Detroit 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, 2007**.

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 and the comments on page 12.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice promulgated by the Actuarial Standards Board of the American Academy of Actuaries. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

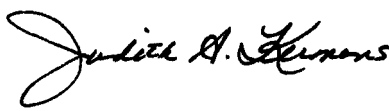
The signing actuaries are Members of the American Academy of Actuaries (M.A.A.A) as indicated, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

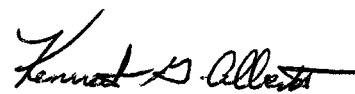
GABRIEL, ROEDER, SMITH & COMPANY



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## **VALUATION RESULTS**

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**EMPLOYER CONTRIBUTION RATES  
COMPUTED PAYABLE LAST DAY OF FISCAL YEAR  
EXPRESSED AS PERCENTS OF ACTIVE MEMBER PAYROLL  
2008-2009 FISCAL YEAR**

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Contributions for	Contributions Expressed as Percents of Payroll for the Fiscal Year Ending June 30,	
	2009	2008
<b>Normal Cost</b>		
Age & service allowances	25.01 %	22.71 %
Disability allowances	4.53 %	5.71 %
Death-in-service allowances	0.45 %	0.49 %
Total	29.99 %	28.91 %
Members current contributions: #	3.64 %	4.17 %
(Future refunds)	(0.36)%	(0.35)%
Available for monthly benefits	3.28 %	3.82 %
<b>Employer Normal Cost</b>	<b>26.71 %</b>	<b>25.09 %</b>
<b>Actuarial Accrued Liabilities</b>		
Total (\$ millions)	\$3,896.8	\$3,809.0
Funding Value of Assets	4,307.2	3,987.5
Unfunded Actuarial Accrued Liabilities		
- dollar (millions)	\$ (410.4)	\$ (178.5)
- amortization percent +	N/A	N/A
<b>Computed Employer Rate ##</b>	<b>26.71 %</b>	<b>25.09 %</b>

# 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.

## Accrued employer contributions were assumed to be charged with interest at 7.8% from the date accrued to the actual date paid.

+ Based on the Board of Trustees funding policy to continue full normal cost contributions when valuation assets exceed accrued liabilities.

## ACTUARIAL ACCRUED LIABILITIES AS OF JUNE 30, 2007

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Present Value, June 30	Amount
<b>Accrued Pension Liabilities</b>	
Retirees and beneficiaries	\$2,675,691,208
Inactive members future deferred pensions	11,013,128
Active members	935,715,410
Total accrued pension liabilities	3,622,419,746
Pension fund balances	4,032,789,275
Unfunded accrued pension liabilities	\$ (410,369,529)
<b>Accrued Annuity Liabilities</b>	
Retirees and beneficiaries	
Future annuities	\$ 7,078,040
Reserve for outstanding refunds	3,988,666
Contingency Reserve	2,401,932 *
Total	\$ 13,468,638
Members annuities & future refunds	260,925,845
Total accrued annuity liabilities	274,394,483
Annuity fund balances	274,394,483
Unfunded accrued annuity liabilities	\$ 0
<b>System Totals</b>	
Actuarial accrued liabilities	\$3,896,814,229
Accrued assets	4,307,183,758
Unfunded actuarial accrued liabilities	\$ (410,369,529)

\* 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		
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%
2002(a)#	248.7	46,203	3,632.0	3,635.1	(3.1)	-	23.39%
2003	248.7	47,305	3,721.6	3,205.5	516.1	2.1	43.89%
2004	258.7	51,126	3,857.5	3,074.5	783.0	3.0	54.36%
2005	250.5	52,197	3,780.4	3,757.9	22.5	0.1	25.98%
2006+&	228.1	52,908	3,809.0	3,980.3	(171.3)	-	25.09%
2007+	230.2	54,647	3,870.7	4,307.2	(436.5)	-	25.16%
2007+*	230.2	54,647	3,896.8	4,307.2	(410.4)	-	26.71%

(a) After changes in actuarial assumptions.

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

\* After Plan Amendments.

# Employer normal cost before full funding credit.

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

+ Based on the Board of Trustees funding policy to continue full normal cost contributions when valuation assets exceed accrued liabilities.

& 2006 assets were revised following the 6/30/2006 valuation.

## SOLVENCY TESTS

The Police and Fire Retirement System of the City of Detroit 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)*

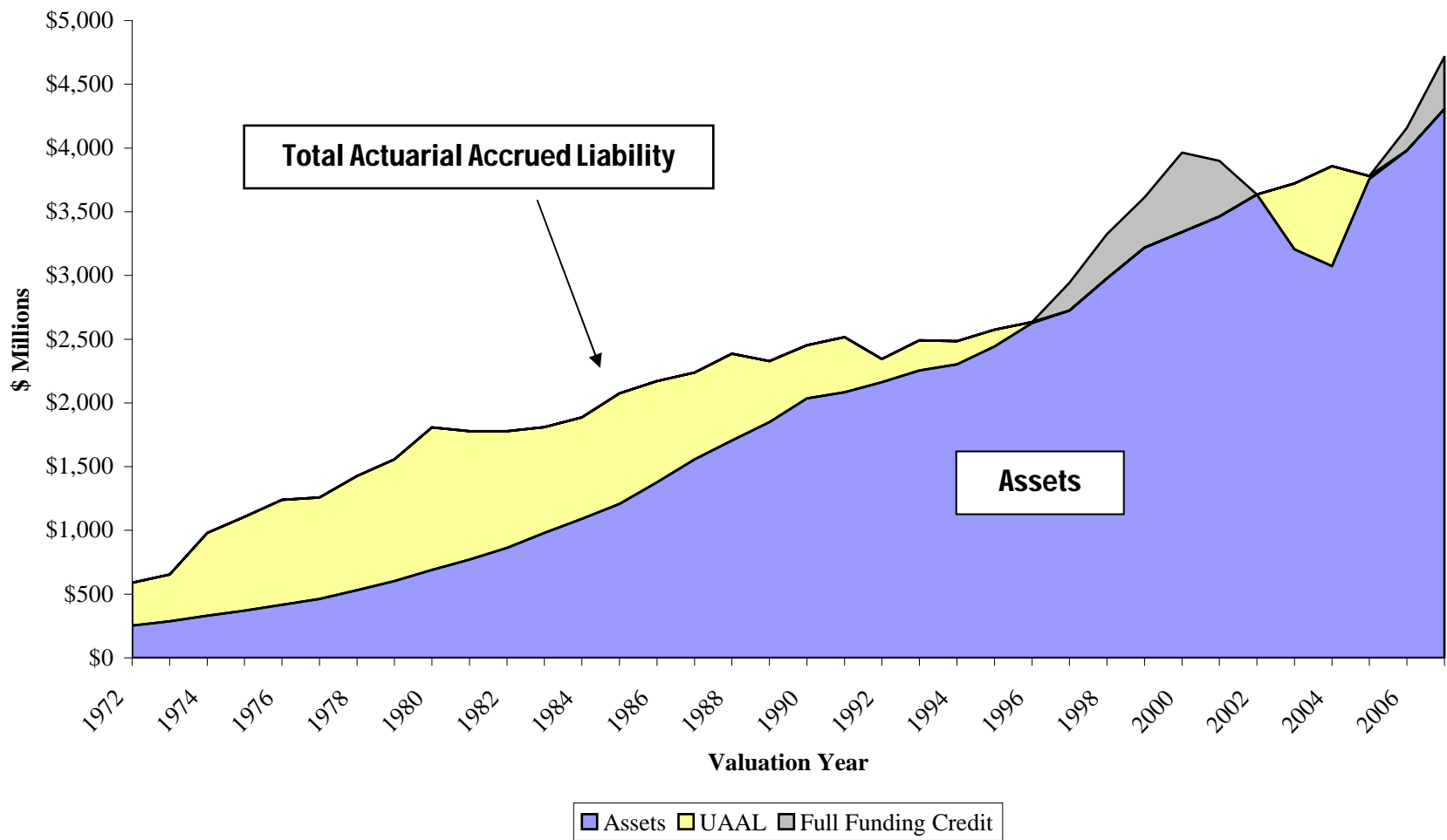
June 30	Actuarial Accrued Liabilities			Assets	Portion of Accrued Liabilities Covered by Assets			
	(1) Active Member Contr.	(2) Retirees and Benef.	(3) Present Members (Employer Financed Portion)		(1)	(2)	(3)	Total
	----- \$ Millions -----							
2003	\$341	\$2,400	\$ 980	\$3,206	100%	100%	47%	86%
2004	303	2,516	1,038	3,075	100%	100%	25%	80%
2005	279	2,543	958	3,758	100%	100%	98%	99%
2006&	270	2,655	884	3,980	100%	100%	120%	105%
2007(a)	261	2,689	947	4,307	100%	100%	143%	111%

(a) After changes in benefit provisions.

& 2006 assets were revised following the 6/30/2006 valuation.



## ASSETS AND ACCRUED LIABILITIES



**DERIVATION OF EXPERIENCE GAIN (LOSS)  
YEAR ENDED JUNE 30, 2007**

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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	\$(178,507,967)
(2) Employer normal cost from last valuation	57,240,366
(3) Actual employer contributions	57,423,366
(4) Interest accrual: (1) x .078	(13,923,621)
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	(192,614,588)
(6) Change due to benefit provision modifications	26,114,672
(7) Change due to revised actuarial methods or assumptions	0
(8) Change due to deferred member data updates #	5,000,000
(9) Expected UAAL after changes: (5) + (6) + (7) + (8)	(161,499,916)
(10) Actual UAAL at end of year	(410,369,529)
(11) Experience gain (loss): (9) - (10)	248,869,613
(12) Experience gain (loss) as a % of beginning of year accrued liability	6.5 %
(13) Experience gain (loss)	248,869,613
(14) Gain (loss) due to investment experience	218,545,931
(15) Gain (loss) from other sources	30,323,682

\* *Unfunded actuarial accrued liability.*

# *System Staff has been working to improve reporting of deferred member data.*

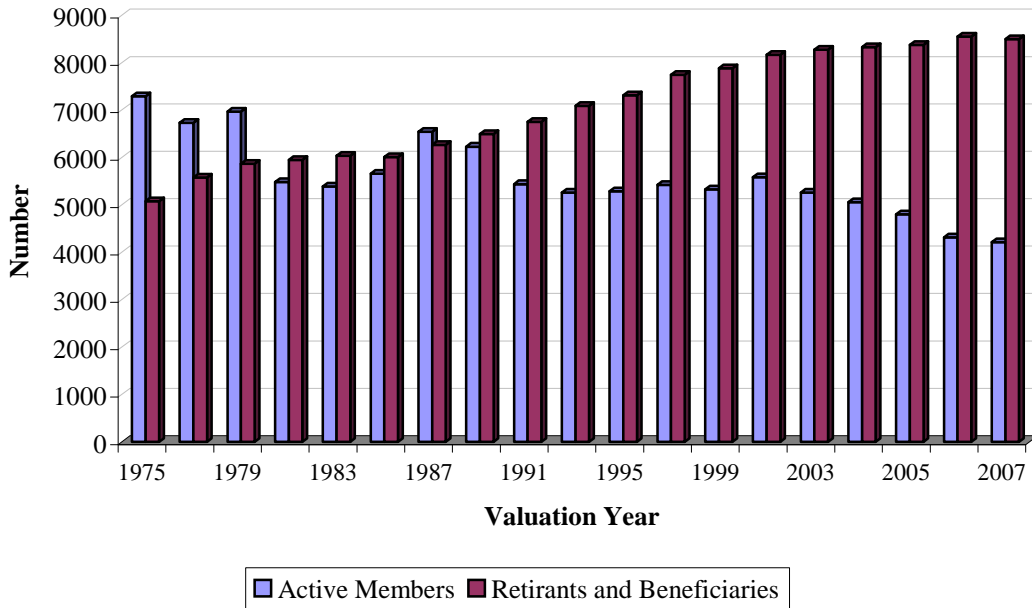
**COMPARATIVE STATEMENT OF ACTIVE MEMBERS  
AND VALUATION PAYROLL**

June 30	No. Members		Total Members					
	1969 Plan	Pre- 1969	No.	% Change	Ratio of Active to Retired	Annual Payroll	Average Pay	
							\$	Change
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 %
2002	5,290	92	5,382	(4)%	0.7	248,663,133	46,203	1.9 %
2003	5,181	76	5,257	(2)%	0.6	248,681,461	47,305	2.4 %
2004	5,007	53	5,060	(4)%	0.6	258,699,581	51,126	8.1 %
2005	4,768	31	4,799	(5)%	0.6	250,491,872	52,197	2.1 %
2006	4,298	14	4,312	(10)%	0.5	228,140,160	52,908	1.4 %
2007	4,204	8	4,212	(2)%	0.5	230,173,964	54,647	3.3 %

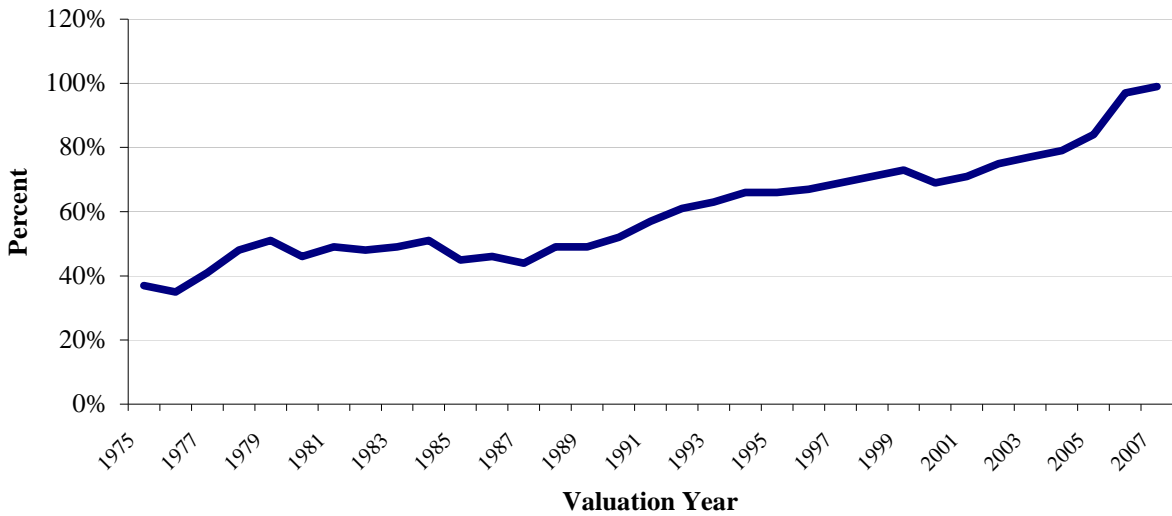
**COMPARATIVE STATEMENT OF ANNUAL RETIREMENT ALLOWANCES  
BEING PAID RETIREES AND BENEFICIARIES**

June 30	No. Retired		% of Current Allowances			Current Allowances		Allowances as a % of Payroll
	Pre-69	Total	Annuities	Pensions	Escalators	Total	Average	
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%
2002	4,229	8,179	0.5%	68.4%	31.1%	185,658,396	22,699	75%
2003	4,104	8,277	0.5%	69.8%	29.7%	191,634,636	23,153	77%
2004	3,961	8,328	0.4%	68.5%	31.1%	203,083,524	24,386	79%
2005	3,791	8,376	0.4%	69.5%	30.1%	211,114,020	25,205	84%
2006	3,666	8,550	0.4%	70.9%	28.7%	222,357,372	26,007	97%
2007	3,501	8,498	0.3%	70.6%	29.1%	227,671,788	26,791	99%

### Active and Retired Members

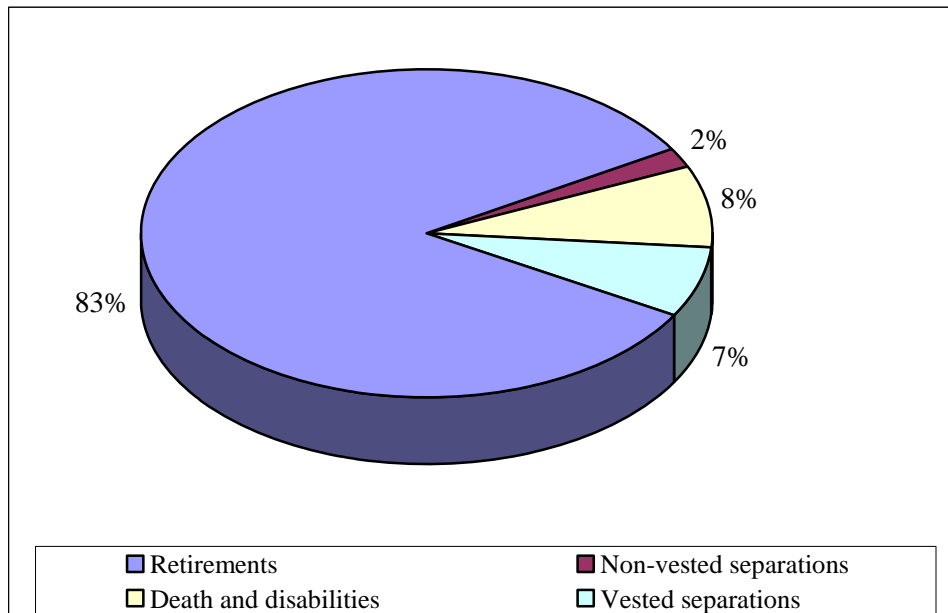


### Retirement Allowances as %s of Active Pays



## EXPECTED TERMINATIONS FROM ACTIVE EMPLOYMENT FOR CURRENT ACTIVE MEMBERS

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The chart shows the expected future development of the present population in simplified terms. The retirement system presently covers 4,212 active members. Eventually, 102 members are expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 3,775 members are expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 335 members are expected to become eligible for death-in-service or disability benefits.

## COMMENTS

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### **Experience during the Past Year**

Investment experience for the year ended June 30, 2007 was more favorable than expected with a market rate of return of 16.26%. Because of the favorable market return this year, the market value of assets now exceeds the funding value by \$174 million. If market returns average 7.8% or more in future years, the excess of \$174 million will ultimately be recognized and further increase the System's funded status.

### **Annuity Reserve Fund**

The Annuity Reserve Fund is currently \$6.4 million higher than the accrued liabilities for Retirees and Beneficiaries. This \$6.4 million excess is comprised of an outstanding refund reserve of \$4 million and a contingency reserve of \$2.4 million. The ratio of the ARF balance to computed liabilities is 122% (see page 3). The Board approved a transfer of \$12 million from the Annuity Reserve Fund to the Pension Accumulation Fund in 2001 and \$5 million in 2005. If the size of the contingency reserve continues to increase, we will recommend another transfer in a future valuation.

### **Arbitration Award**

The June 30, 2007 valuation reflects the following benefit changes for DPOA and DFFA members. 1) Eligible members can retire after twenty years of service regardless of age. 2) All members who have served in the military may purchase a maximum of three years pension credit. 3) Unused sick leave payout upon retirement or death includable in the computation of AFC has been increased to 70%.

### **Assumptions and Methods**

The last assumption and method review (Experience Study) was completed for the period ending June 30, 2002. The next study will review experience for the period ending June 30, 2007 and will be performed subsequent to this report.

### **Conclusion**

**Based upon the funding policy established by the Board, the data furnished by the Retirement System and the actuarial assumptions shown in the Appendix, the recommended employer contribution rate for the 2008-2009 fiscal year is 26.71% of covered payroll.**

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**DATA FURNISHED FOR VALUATION**

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# SUMMARY OF BENEFIT PROVISIONS (JULY 1, 2007)

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## *Age and Service Retirement*

**Eligibility** - 25 years of service regardless of age. 20 years of service regardless of age for eligible DPOA and DFFA members.

**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 (last 3 years for DPCOA, Executive Members and their Fire equivalents). 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. 70% of unused sick leave payout is added to the AFC upon retirement or death for DPOA and DFFA members.

## *Deferred Retirement (vested benefit)*

**Eligibility** - 10 years of service for DPOA and Fire equivalents, age 40 with 8 years of service for all others.

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

**Benefit Commencement - DPOA and Fire equivalent members hired after 6/30/85:** Unreduced benefit begins at age 62. **All other members:** Unreduced benefit begins at the age when the member would have first been eligible for regular retirement had the member continued in City service. **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 (CONCLUDED)

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### *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 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 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** - Police retired after July 1, 2001, certain Police classes retired after July 1, 1998 and all Fire members: Pensions increase by 2.25% of the **current** pension amount each July 1. All other members: 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.

### *DROP*

A potential Deferred Retirement Option Plan (DROP) plan has been pending for several years. Final details of specific DROP provisions are still being developed.

## ASSET INFORMATION FURNISHED FOR VALUATION

### *Reserve Accounts\**

Funds	Fund Balances	
	June 30, 2007	June 30, 2006 &
Annuity Savings	\$ 260,925,845	\$ 269,912,502
Annuity Reserve	13,468,638	9,619,756
Total Annuity Funds	274,394,483	279,532,258
Pension Accumulation	689,640,161	
Pension Reserve	2,675,631,660	2,645,716,712
Accrued Liability Fund Reserve	651,040,589	
Survivor Benefit	16,454,856	20,824,839
Total Pension Funds	4,032,767,266	3,700,742,757
Total Fund Balances @	\$4,307,161,749	\$3,980,275,015

### *Revenues and Expenditures\**

	2006-2007	2005-2006 &
Balance - June 30	\$3,980,254,576	\$3,757,884,417
Revenues		
Employes' contributions	10,043,736	10,007,531
Employer contributions #	57,423,366	57,766,542
Recognized investment income	525,164,846	397,651,211
Total	592,631,948	465,425,284
Expenditures		
Regular benefit payments	225,249,847	217,411,446
Other benefit payments	0	0
Withdrawal of member contributions	36,708,694	22,244,391
Administrative expenses	3,744,225	3,399,288
Total	265,702,766	243,055,125
Balance - June 30 @	\$4,307,183,758	\$3,980,254,576
<b>Ratio of Net Investment Income to Mean Assets</b>	<b>13.4%</b>	<b>10.7%</b>

\* Reported on an actuarial value basis. Excludes the Market Stabilization Fund.

# Employer contributions for FY07 of \$57,423,366 are accrued.

@ Reported ending June 30, 2007 balances differ by \$22,009.

& 2006 assets were revised following the 6/30/2006 valuation.

## REPORTED FUNDING VALUE OF ASSETS #

	2004	2005	2006	2007	2008	2009
A. Funding Value Beginning of Year	\$3,205,516,657	\$3,074,516,589	\$3,757,884,417	\$3,980,254,576		
B. Market Value End of Year	3,122,510,425	3,828,945,164	4,035,404,493	4,481,349,902		
C. Market Value Beginning of Year	2,878,264,946	3,122,510,425	3,828,945,164	4,035,404,493		
D. Contributions During Year						
D1. City Contributions (End of Year)	69,475,202	682,431,785	57,766,542	57,423,366		
D2. Member Contributions	10,318,299	10,430,854	10,007,531	10,043,736		
E. Benefits Paid During Year	247,511,932	242,552,524	239,655,837	261,958,542		
F. Investment Income						
F1. Market Total: B - C - D + E	411,963,910	256,124,624	378,341,093	640,436,849		
F2. Amount for Immediate Recognition (7.8% of mean Fund balances)	240,621,434	235,204,742	306,076,159	415,320,101		
F3. Amount for Phased-In Recognition: F1-F2	171,342,476	20,919,882	72,264,934	225,116,748		
G. Phased-In Recognition of Investment Income						
G1. Current Year: F3/3	57,114,159	6,973,294	24,088,311	75,038,916		
G2. 1st Prior Year:	(66,234,483)	57,114,159	6,973,294	24,088,311	\$75,038,916	
G3. 2nd Prior Year:	(194,782,747)	(66,234,483)	57,114,159	6,973,294	24,088,312	\$75,038,916
G4. Total Recognized Investment Gain	(203,903,071)	(2,147,030)	88,175,764	106,100,521	99,127,228	75,038,916
H. Total Interest Distributed - Current Year: (F2 + G4)	36,718,363	233,057,712	394,251,923	521,420,622		
I. Funding Value End of Year: A + D - E + H	3,074,516,589	3,757,884,417	3,980,254,576	4,307,183,758		
J. Difference Between Market & Funding Value: (B - I)	47,993,836	71,060,747	55,149,917	174,166,144		
K. Recognized Rate of Return: $H / [1/2 (A + I - H)]$	1.2%	7.1%	10.7%	13.4%		
L. Market Rate of Return: $F1 / [C - 1/2 (E - D)]$	14.7%	7.7%	10.1%	16.3%		

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.

# *Furnished by the Retirement System.*

**RETIREES AND BENEFICIARIES JUNE 30, 2007**  
**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*	13	\$ 27,176			71	\$ 32,306	84	\$ 59,482
20-24	1	1,125					1	1,125
25-29	2	3,319	10	\$ 23,789	4	6,001	16	33,109
30-34	6	11,478	19	49,577	5	7,284	30	68,339
35-39	6	3,680	46	129,072	5	6,002	57	138,754
40-44	22	18,181	98	260,441	8	12,847	128	291,469
45-49	73	99,500	115	295,551	17	22,314	205	417,365
50-54	401	844,748	201	495,447	35	52,557	637	1,392,752
55-59	1,114	2,818,930	469	1,020,461	47	68,740	1,630	3,908,131
60-64	1,221	3,152,420	435	918,319	40	60,905	1,696	4,131,644
65-69	766	1,874,025	189	392,800	24	35,554	979	2,302,379
70-74	467	1,030,904	82	188,453	14	25,779	563	1,245,136
75-79	648	1,382,148	118	263,025	36	61,966	802	1,707,139
80-84	832	1,676,562	127	273,345	38	68,757	997	2,018,664
85-89	435	806,253	48	111,425	21	34,604	504	952,282
90-94	125	223,734	12	28,826	6	11,059	143	263,619
95 & Over	23	35,675	1	2,050	2	3,535	26	41,260
<b>Totals</b>	<b>6,155</b>	<b>\$14,009,858</b>	<b>1,970</b>	<b>\$4,452,581</b>	<b>373</b>	<b>\$510,210</b>	<b>8,498</b>	<b>\$18,972,649</b>

\* May include records with defective birth dates.

**INACTIVE VESTED MEMBERS JUNE 30, 2007**  
**TABULATED BY ATTAINED AGE**

Attained Age	No.	Estimated Annual Allowances
Under 40	20	\$ 271,754
40-44	25	464,625
45-49	20	386,288
50-54	14	272,793
55-59	17	351,680
60-64	10	231,799
65 & over	5	145,676
<b>Totals</b>	<b>111</b>	<b>\$2,124,615</b>

**PRE 1969 RETIREES AND BENEFICIARIES JUNE 30, 2007**  
**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	\$ 6,099					5	\$ 6,099
20-24								
25-29			1	\$ 2,379			1	2,379
30-34								
35-39	1	991					1	991
40-44								
45-49	4	4,158					4	4,158
50-54	5	5,608			2	\$ 3,584	7	9,192
55-59	22	33,273	1	972	9	16,183	32	50,428
60-64	263	486,288	137	282,065	15	26,522	415	794,875
65-69	388	776,327	133	272,791	19	28,164	540	1,077,282
70-74	315	624,163	61	124,618	11	18,969	387	767,750
75-79	443	855,194	105	228,491	34	56,931	582	1,140,616
80-84	716	1,389,359	119	254,853	36	65,169	871	1,709,381
85-89	423	782,667	48	111,425	19	32,746	490	926,838
90-94	125	223,734	12	28,826	6	11,059	143	263,619
95 & Over	20	32,427	1	2,050	2	3,535	23	38,012
<b>Totals</b>	<b>2,730</b>	<b>\$5,220,288</b>	<b>618</b>	<b>\$1,308,470</b>	<b>153</b>	<b>\$262,862</b>	<b>3,501</b>	<b>\$6,791,620</b>

\* May include records with defective birth dates.

# Includes survivor beneficiaries of service and disability retirees.

**ACTIVE MEMBERS JUNE 30, 2007**  
**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									
20-24	33							33	\$ 1,283,489
25-29	68	184	5					257	12,319,128
30-34	38	336	184					558	28,307,813
35-39	13	299	365	32	1			710	37,436,889
40-44	10	114	162	87	168			541	29,919,541
45-49	6	42	55	44	256	3		406	23,137,066
50-54	4	8	23	27	195	65	16	338	19,885,204
55-59	2	3	4	5	68	49	58	189	11,209,542
60				2	1	3	10	16	961,874
61					1	2	4	7	413,991
62		1		1		1	4	7	404,678
63					2		2	4	214,595
64							4	4	228,470
65							3	3	164,372
66							2	2	134,824
68							3	3	164,415
72							1	1	50,180
<b>Totals</b>	<b>174</b>	<b>987</b>	<b>798</b>	<b>198</b>	<b>692</b>	<b>123</b>	<b>107</b>	<b>3,079</b>	<b>\$166,236,071</b>

*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	4							4	\$ 142,401
25-29	37	48						85	3,877,408
30-34	31	98	16					145	7,123,254
35-39	13	89	74	56	1			233	12,080,883
40-44	2	27	54	106	47	1		237	13,428,535
45-49	1	14	21	61	62	8	1	168	9,844,390
50-54		2	3	17	49	62	5	138	8,803,747
55-59				2	8	28	80	118	8,281,207
60					1	2	2	5	356,068
<b>Totals</b>	<b>88</b>	<b>278</b>	<b>168</b>	<b>242</b>	<b>168</b>	<b>101</b>	<b>88</b>	<b>1,133</b>	<b>\$63,937,893</b>

**TOTAL ACTIVE MEMBERS JUNE 30, 2007**  
**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									
20-24	37							37	\$ 1,425,890
25-29	105	232	5					342	16,196,536
30-34	69	434	200					703	35,431,067
35-39	26	388	439	88	2			943	49,517,772
40-44	12	141	216	193	215	1		778	43,348,076
45-49	7	56	76	105	318	11	1	574	32,981,456
50-54	4	10	26	44	244	127	21	476	28,688,951
55-59	2	3	4	7	76	77	138	307	19,490,749
60				2	2	5	12	21	1,317,942
61					1	2	4	7	413,991
62		1		1		1	4	7	404,678
63					2		2	4	214,595
64							4	4	228,470
65							3	3	164,372
66							2	2	134,824
68							3	3	164,415
72							1	1	50,180
<b>Totals</b>	<b>262</b>	<b>1,265</b>	<b>966</b>	<b>440</b>	<b>860</b>	<b>224</b>	<b>195</b>	<b>4,212</b>	<b>\$230,173,964</b>

	Group Averages		
	Police	Fire	Total
Age:	40.5 years	42.1 years	40.9 years
Service:	13.9 years	16.1 years	14.5 years
Annual Pay:	\$53,990	\$56,432	\$54,647



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

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**This information is presented in draft form for review by the System's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the System's financial statements.**

## GASB STATEMENT NO. 25 REQUIRED SUPPLEMENTARY INFORMATION

Actuarial Valuation Date	Actuarial Value of Assets (a)	Schedule of Funding Progress			Covered Payroll (c)	UAAL as a % of Covered Payroll ((b - a) / c)
		Actuarial Accrued Liability (AAL) -- Entry Age (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)		
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	-
2002#	3,635,106,581	3,631,971,448	(3,135,133)	100.1%	248,663,133	-
2003	3,205,516,657	3,721,593,210	516,076,553	86.1%	248,681,461	207.5 %
2004	3,074,516,589	3,857,493,282	782,976,693	79.7%	258,699,581	302.7 %
2005@&	3,757,884,417	3,780,447,414	22,562,997	99.4%	250,491,872	9.0 %
2006&	3,980,254,576	3,808,952,741	(171,301,835)	104.5%	228,140,160	-
2007	4,307,183,758	3,870,699,557	(436,484,201)	111.3%	230,173,964	-
2007*	4,307,183,758	3,896,814,229	(410,369,529)	110.5%	230,173,964	-

\* Plan amended.

# After changes in actuarial assumptions.

@ After POC transfer.

& 2005 and 2006 assets were revised following the 6/30/2006 valuation.

### SCHEDULE OF EMPLOYER CONTRIBUTIONS

Fiscal Year Ended June 30	Reported City Contribution
1997	\$ 54,572,561
1998	48,120,578
1999	15,709,799
2000	19,972,058
2001	14,443,382
2002	8,449,645
2003	66,843,029
2004	69,475,202
2005#	682,431,785
2006&	57,766,542
2007	57,423,366

# Includes POC proceeds.

& 2006 assets were revised following the 6/30/2006 valuation.

## 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, 2007
Actuarial cost method	Entry Age
Amortization method	Level percent
Remaining amortization period	28 years closed #
Asset valuation method	3 year smoothed market
<b>Actuarial assumptions:</b>	
Investment rate of return	7.8%
Projected salary increases*	5.8% - 10.8%
*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.

# Assets exceeded actuarial accrued liabilities as of June 30, 2007. This is the amortization period that would be used if there were unfunded liabilities as of the valuation date.

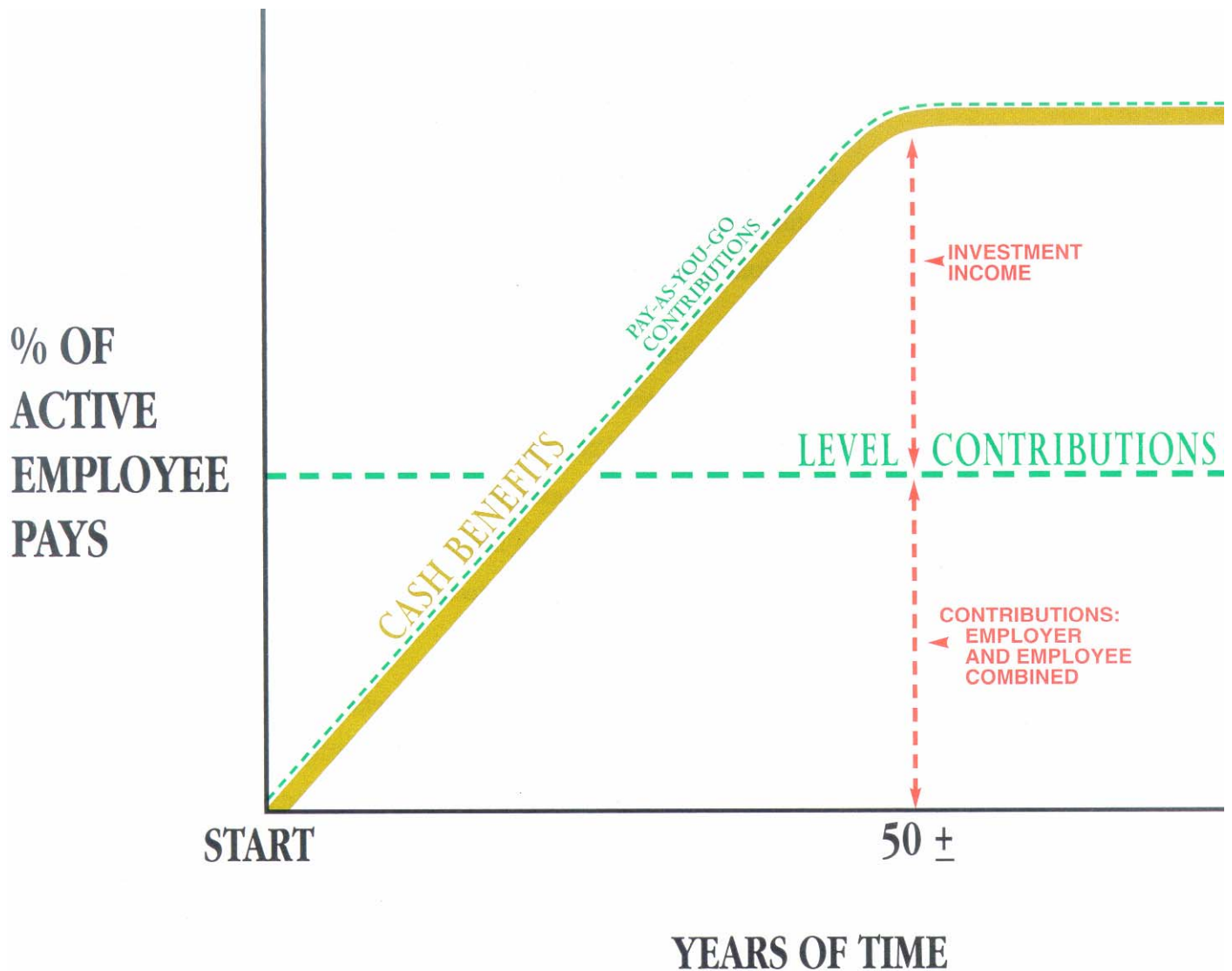
Membership of the plan consisted of the following at June 30, 2007, the date of the latest actuarial valuation:

Retirees and beneficiaries receiving benefits	8,498
Terminated plan members entitled to but not yet receiving benefits	111
Active plan members	4,212
<b>Total</b>	<b>12,821</b>

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# **FINANCIAL PRINCIPLES**

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**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

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*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.

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*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

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**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:

$$\mathbf{B = C + I - E}$$

**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 . . .

**Ivestment** 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.



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## **APPENDIX**

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

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**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 4% over price inflation.

*Pay increase assumptions* for individual active members are shown on page 29. 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 29. This table was first used for the June 30, 1998 valuation. For disabled members, 110% of the 1983 Group Annuity Mortality Table was used to measure post-retirement mortality.

*The probabilities of age/service retirement* for members eligible to retire are shown on page 30. Probabilities for 25 years of service eligibility were last revised for the June 30, 2003 valuation. Probabilities for 20 years of service eligibility were added for the June 30, 2007 valuation.

*The probabilities of separation* from service (including *death-in-service*) are shown for sample ages on page 31. These probabilities were last revised for the June 30, 2003 valuation.

## MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

### JUNE 30, 2007

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<b>Marriage Assumption:</b>	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
<b>Pay Increase Timing:</b>	End of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year beginning the day after the valuation date.
<b>Decrement Timing:</b>	Decrements are assumed to occur mid-year.
<b>Eligibility Testing:</b>	Eligibility for benefits is determined based upon the age nearest birthday and exact fractional service nearest the date the decrement is assumed to occur.
<b>Decrement Relativity:</b>	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
<b>Decrement Operation:</b>	Disability and mortality decrements do not operate during the first 5 years of service. Disability also does not operate during retirement eligibility.
<b>Incidence of Contributions:</b>	Member contributions are assumed to be received continuously throughout the year. Employer contributions are assumed to be received on the last day of the fiscal year.
<b>Longevity in AFC:</b>	Longevity payments included in the computation of Average Final Compensation were assumed to increase age and service costs by 4% and disability and death-in-service costs by 2%.
<b>Unused Sick Leave Payout:</b>	Unused sick leave payout was assumed to increase future costs by .05% of payroll.
<b>Post-Retirement COLA:</b>	Active members are assumed to receive a 1.9% COLA rather than 2.25% because the annuity portion is not subject to the COLA.
<b>FAC Period:</b>	1 year FAC period was used.
<b>Disability Change Age:</b>	The duty disability benefit is assumed to change at normal retirement age.
<b>DROP Plan:</b>	The normal cost was increased by 1% of payroll to estimate the potential affect of the DROP plan on system costs.

## FUNDING METHODS

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*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 3%. In addition, active member accrued liabilities were increased by 2% to approximate the effect of incomplete service data.

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*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

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<b>Service</b>	<b>Salary Increase Assumptions for an Individual Member</b>		
	<b>Merit &amp; Seniority</b>	<b>Base (Economic)</b>	<b>Increase Next Year</b>
5	6.00%	4.80%	10.80%
10	2.00%	4.80%	6.80%
15	1.00%	4.80%	5.80%
20	1.00%	4.80%	5.80%
25	1.00%	4.80%	5.80%
30	1.00%	4.80%	5.80%
35	1.00%	4.80%	5.80%
Ref			21 + 4.80%

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

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<b>Sample Attained Ages</b>	<b>Present Value of \$1.00 Monthly Increasing "X"% Annually After Retirement</b>						<b>Future Life Expectancy (years)</b>	
	<b>4.8% Compound</b>		<b>2.25% Simple</b>		<b>2.25% Compound</b>		<b>Men</b>	<b>Women</b>
	<b>Men</b>	<b>Women</b>	<b>Men</b>	<b>Women</b>	<b>Men</b>	<b>Women</b>		
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	14.10
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

Service	Percent of Eligible Active Members Retiring Within Next Year				Police & Fire	Retirement Ages
	Police		Fire			
19	25%		15%		25%	60
20	18%		12%		25%	61
21	18%		12%		25%	62
22	18%		12%		22%	63
23	18%		12%		20%	64
24	18%	35%	12%	20%	18%	65
25	18%	25%	12%	20%	15%	66
26	18%	20%	12%	15%	15%	67
27	18%	20%	12%	15%	15%	68
28	18%	20%	12%	15%	15%	69
29	18%	18%	15%	15%	15%	70
30	18%	18%	15%	15%	15%	71
31	18%	18%	15%	15%	15%	72
32	20%	20%	15%	15%	15%	73
33	25%	25%	20%	20%	15%	74
34	30%	30%	25%	25%	40%	75
35	30%	30%	30%	30%	30%	76
36	30%	30%	30%	30%	30%	77
37	30%	30%	30%	30%	30%	78
38	30%	30%	30%	30%	30%	79
39	30%	30%	30%	30%	30%	80
40	100%	100%	100%	100%	30%	81
					30%	82
					30%	83
					30%	84
					100%	85
Ref	1548	823	1549	824	537	

## PROBABILITIES OF SEPARATION

Sample Ages	Years of Service	% of Active Members Separating Within Next Year			
		Withdrawal		Death	
		Police	Fire	Male	Female
ALL	0	7.00%	5.00%		
	1	5.50%	4.00%		
	2	4.00%	3.00%		
	3	4.00%	2.00%		
	4	3.50%	2.00%		
25	5 & Over	4.50%	2.30%	0.02%	0.01%
30		3.30%	1.90%	0.03%	0.02%
35		2.30%	1.30%	0.04%	0.02%
40		1.70%	0.90%	0.06%	0.03%
45		1.50%	0.70%	0.11%	0.05%
50		1.10%	0.60%	0.20%	0.08%
55		0.80%	0.60%	0.31%	0.13%
60		0.80%	0.60%	0.46%	0.21%
Ref		154 207	230 113	30 x .50	31 x .50

Sample Ages	% of Active Members Becoming Disabled Within Next Year			
	Police		Fire	
	Ordinary	Duty	Ordinary	Duty
25	0.08%	0.15%	0.08%	0.31%
30	0.09%	0.22%	0.09%	0.46%
35	0.11%	0.38%	0.11%	0.80%
40	0.14%	0.55%	0.14%	1.16%
45	0.21%	0.81%	0.21%	1.71%
50	0.62%	1.29%	0.62%	2.72%
55	0.97%	2.19%	0.97%	4.61%
60	1.10%	3.15%	1.10%	6.64%
Ref	105 x 1.00	90 x 0.95	105 x 1.00	90 x 2.00

## MEANING OF “UNFUNDED ACTUARIAL ACCRUED LIABILITIES”

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*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.”

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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.

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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

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***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.

March 4, 2008

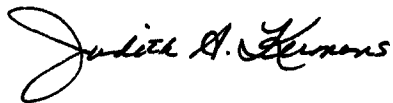
Mr. Walter Stampor  
Executive Secretary  
The Police and Fire Retirement System of the  
City of Detroit  
2 Woodward Avenue – Suite 908  
Detroit, Michigan 48226

**Re: June 30, 2007 Actuarial Valuation**

Dear Walter:

Enclosed are 20 copies of the report of the June 30, 2007 annual actuarial valuation.

Sincerely,



Judith A. Kermans

JAK:mrh  
Enclosures

cc: Cynthia Thomas, City of Detroit Retirement Systems  
Norman Jones, GRS  
Kenneth Alberts, GRS