

**THE POLICE AND FIRE RETIREMENT SYSTEM OF THE
CITY OF DETROIT**
71ST ANNUAL ACTUARIAL VALUATION
JUNE 30, 2012

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May 22, 2013

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

The results of the **71st 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, to determine contribution rates for the 2014 fiscal year in accordance with the established funding policy, and to determine actuarial information for Governmental Accounting Standards Board (GASB) Statements No. 25 and No. 27. The results of the valuation may not be applicable for other purposes.

The date of the valuation was **June 30, 2012**.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic and demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

The actuarial assumptions used in the valuation are summarized in the Appendix. Benefit provisions are summarized on pages 14-16. System asset information was provided by retirement system staff. It was reviewed for general reasonableness, but not otherwise audited by the actuary.

Participant 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. The actuary is not responsible for the accuracy of the data provided by the system. Please see the assumptions section (page 31) which shows that there is a load for "incomplete service" in the data.

Your attention is directed particularly to the employer contribution rates on page 2 and the comments on pages 12 and 13.

This report has been prepared by actuaries who have substantial experience valuing public sector 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.

Board of Trustees
May 22, 2013
Page 2

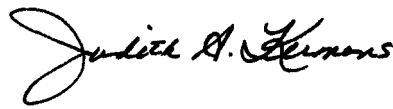
One or more of the signing actuaries are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

The intended audience is the Board of Trustees for the Police and Fire Retirement System of the City of Detroit and their staff. If supplied to other parties, the report should be supplied in its entirety. The authors of this report are available to answer questions from the Board and Staff as needed.

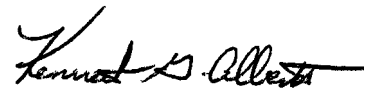
Respectfully submitted,



Norman L. Jones, FSA, MAAA



Judith A. Kermans, EA, MAAA



Kenneth G. Alberts

NLJ:bd

VALUATION RESULTS

**EMPLOYER CONTRIBUTION RATES
COMPUTED PAYABLE LAST DAY OF FISCAL YEAR
EXPRESSED AS PERCENTS OF ACTIVE MEMBER PAYROLL
2013-2014 FISCAL YEAR**

Valuation Date June 30	2012	2011
Contribution for Fiscal Year	2014	2013
Normal Cost		
Age & service allowances	22.28 %	21.09 %
Disability allowances	3.56 %	3.71 %
Death-in-service allowances	0.40 %	0.38 %
Total	26.24 %	25.18 %
Members current contributions #	3.88 %	3.45 %
(Future refunds)	(0.38)%	(0.38)%
Available for monthly benefits	3.50 %	3.07 %
Employer Normal Cost	22.74 %	22.11 %
Actuarial Accrued Liabilities		
Total (\$ millions)	\$3,822.7	\$3,808.6
Funding Value of Assets	3,675.5	3,804.8
Unfunded Actuarial Accrued Liabilities		
- dollar (millions)	\$ 147.2	3.8
- amortization percent +	6.70 %	0.16 %
Computed Employer Rate	29.44 %	22.27 %
Computed Employer Rate with Interest Adjustment *	30.59 %	23.14 %
Estimated Dollar Contributions		
Employer Normal Cost (\$ million)	\$ 48.7	\$ 50.6
Actuarial Accrued Liabilities (\$ million)	14.3	0.4
Total (\$ million) @	\$ 63.0	\$ 51.0

Member statutory contributions of 5% to the Annuity Savings Fund are not payable during all periods of covered employment. The rate shown is the weighted average of expected contributions divided by expected pay in the upcoming fiscal year.

+ Based on the Board of Trustees funding policy to continue full normal cost contributions when valuation assets exceed accrued liabilities and the use of a closed 29-year level dollar amortization period when accrued liabilities exceed assets.

* Computed Employer Rate if paid at end of year.

@ In addition, to the estimated dollars shown above for FY 2013 and FY 2014, there is a contribution receivable carried over from FY 2012 of \$49.8 million plus interest. The FY 2014 contribution above is based on the assumption that the contributions for FY 2012 and FY 2013 will be paid on a timely basis or with interest, based on the valuation assumed rate of return.

ACTUARIAL ACCRUED LIABILITIES AS OF JUNE 30, 2012

Present Value, June 30	Amount
Accrued Pension Liabilities	
Retirees and beneficiaries	\$2,804,974,749
Inactive members future deferred pensions	23,445,601
Active members	778,428,228
Total accrued pension liabilities	3,606,848,578
Pension fund balances	3,459,632,180
Unfunded accrued pension liabilities	\$ 147,216,398
Accrued Annuity Liabilities	
Retirees and beneficiaries	
Future annuities	\$ 4,460,478
Reserve for outstanding refunds & contingencies	12,800,390
Total	\$ 17,260,868
Members annuities & future refunds	198,566,556
Total accrued annuity liabilities	215,827,424
Annuity fund balances	215,827,424
Unfunded accrued annuity liabilities	\$ 0
System Totals	
Actuarial accrued liabilities	\$3,822,676,002
Accrued assets	3,675,459,604
Unfunded actuarial accrued liabilities	\$ 147,216,398

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		
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%
2008+	232.8	57,090	3,992.4	4,316.3	(323.9)	-	26.75%
2008+(a)	232.8	57,090	4,071.1	4,316.3	(245.2)	-	26.27%
2009	231.8	57,418	4,221.3	3,945.2	276.1	1.2	35.22%
2010	228.8	57,322	4,180.1	3,412.8	767.3	3.4	49.75%
2010(a)	228.8	57,322	3,987.5	3,853.3	134.2	0.6	28.90%
2010(a)*	228.8	57,322	3,767.4	3,853.3	(85.9)	-	23.02%
2011	220.5	57,773	3,808.6	3,804.8	3.8	0.0	23.14%
2012(a)	205.8	57,374	3,822.7	3,675.5	147.2	0.7	30.59%

(a) After changes in actuarial assumptions and/or methods.

(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 1998-1999 13th 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.

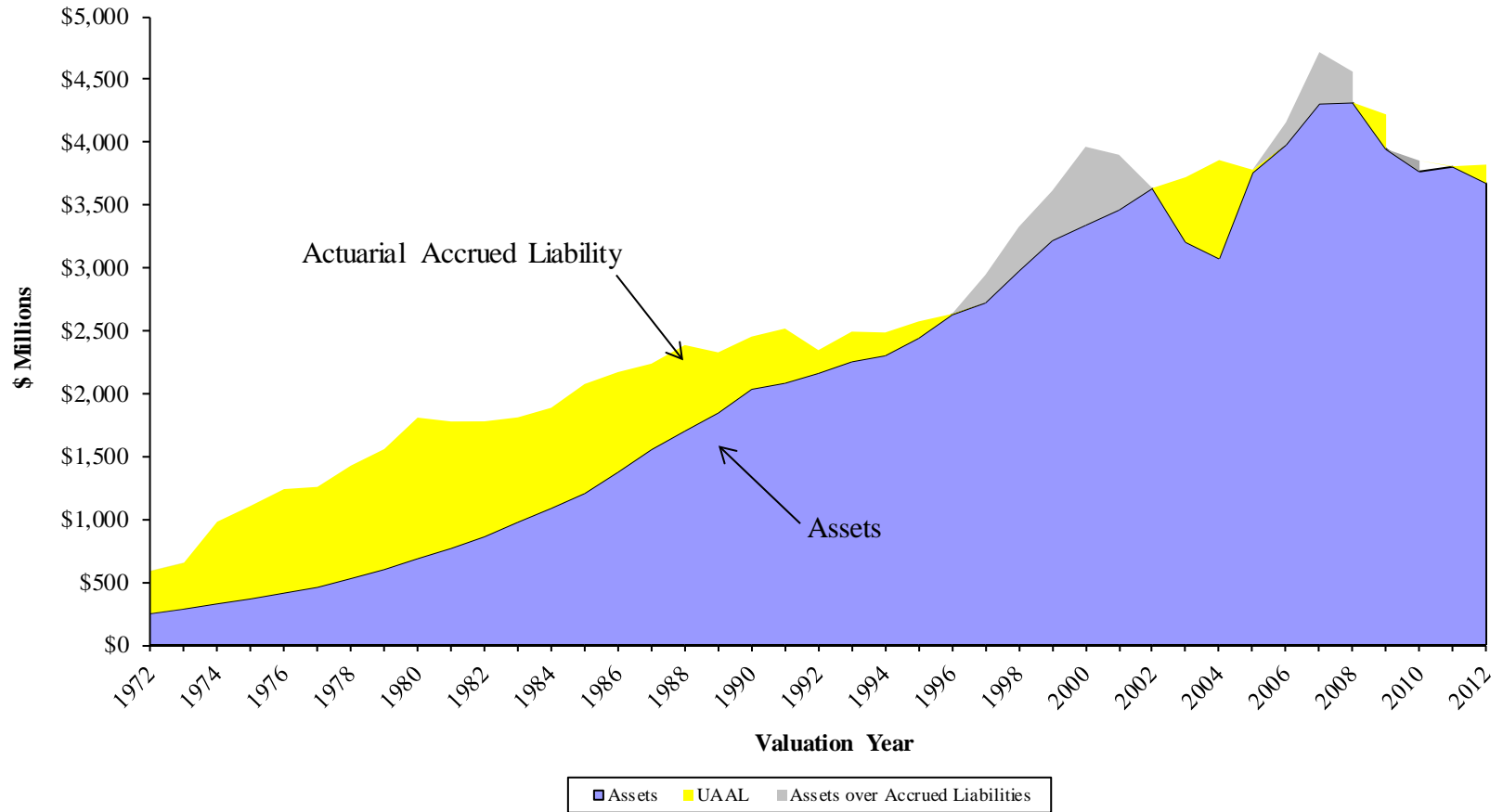
Short-Term Solvency Test 5-Year Comparative Statement (\$ millions)

June 30	Actuarial Accrued Liabilities			Funding Value of 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 -----						
2008(a)	\$ 268	\$ 2,793	\$ 1,010	\$ 4,316	100%	100%	124%	106%
2009	301	2,837	1,083	3,945	100%	100%	75%	93%
2010#(a)	298	2,743	726	3,853	100%	100%	112%	102%
2011	230	2,717	861	3,805	100%	100%	100%	100%
2012#	199	2,822	801	3,675	100%	100%	82%	96%

(a) After changes in benefit provisions.

After changes in actuarial assumptions and/or methods.

ASSETS AND ACCRUED LIABILITIES



**DERIVATION OF EXPERIENCE GAIN (LOSS)
YEAR ENDED JUNE 30, 2012**

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	\$ 3,882,665
(2) Employer and employee normal cost from last valuation	54,145,391
(3) Actual employer and employee contributions	59,298,613
(4) Interest accrual: (1) x .080	310,613
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	(959,944)
(6) Change due to benefit provision modifications	0
(7) Change due to revised actuarial methods and/or assumptions	(18,590,896)
(8) Asset method change	0
(9) Expected UAAL after changes: (5) + (6) + (7) + (8)	(19,550,840)
(10) Actual UAAL at end of year	147,216,398
(11) Experience gain (loss): (9) - (10)	(166,767,238)
(12) Experience gain (loss) as a % of beginning of year accrued liability	(4.4)%
(13) Experience gain (loss)	(166,767,238)
(14) Gain (loss) due to investment experience	(155,700,221)
(15) Gain (loss) from other sources	(11,067,017)

* *Unfunded actuarial accrued liability.*

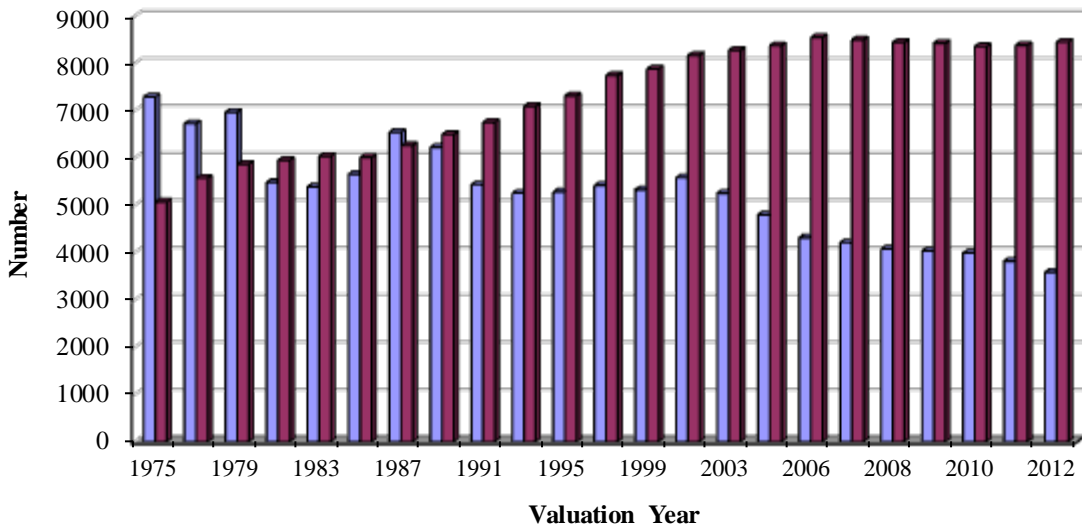
**COMPARATIVE STATEMENT OF ACTIVE MEMBERS
AND VALUATION PAYROLL**

June 30	No. of Members		Total Members					
	1969 Plan	Pre- 1969	No.	% Change	Ratio of Active to Retired	Annual Payroll	Average Pay	
							\$	Change
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 %
2008	4,071	7	4,078	(3)%	0.5	232,812,606	57,090	4.5 %
2009	4,030	7	4,037	(1)%	0.5	231,795,528	57,418	0.6 %
2010	3,985	7	3,992	(1)%	0.5	228,829,999	57,322	(0.2)%
2011	3,809	7	3,816	(4)%	0.5	220,461,691	57,773	0.8 %
2012	3,580	7	3,587	(6)%	0.4	205,800,278	57,374	(0.7)%

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

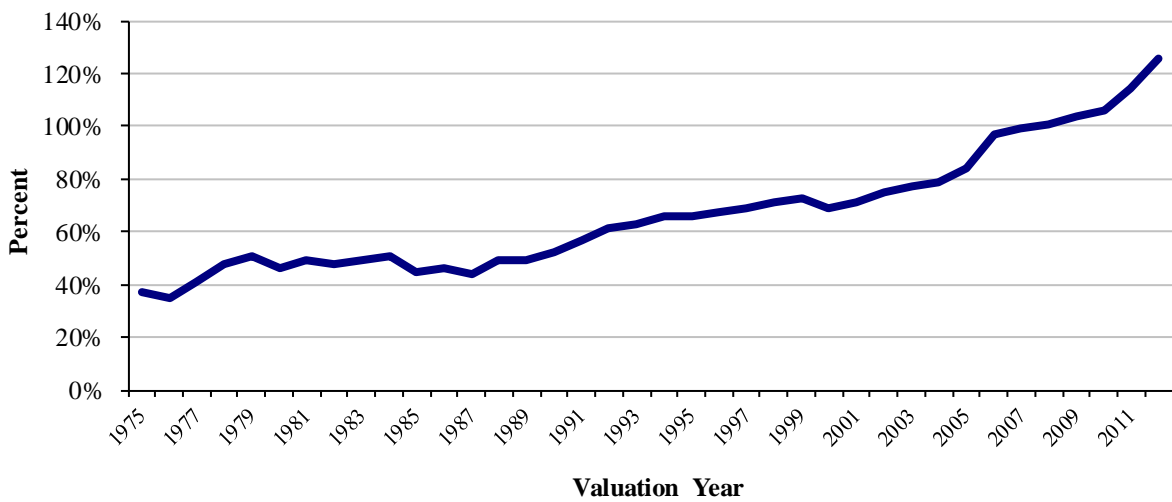
June 30	No. Retired		% of Current Allowances			Current Allowances		Allowances as a % of Payroll
	Pre-69	Total	Annuities	Pensions	Escalators	Total	Average	
1978	5,760	5,760	2.8%	44.2%	53.0%	\$ 58,117,007	\$ 10,090	35%
1979	5,869	5,869	2.6%	51.3%	46.1%	61,355,273	10,454	35%
1980	5,676	5,911	2.1%	45.3%	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%
2008	3,318	8,442	0.3%	70.0%	29.7%	234,223,368	27,745	101%
2009	3,168	8,424	0.3%	70.1%	29.6%	240,094,968	28,501	104%
2010	3,035	8,356	0.3%	70.3%	29.4%	243,688,596	29,163	106%
2011	2,861	8,379	0.2%	71.6%	28.2%	250,376,700	29,881	114%
2012	2,723	8,451	0.2%	72.2%	27.6%	258,660,084	30,607	126%

Active and Retired Members

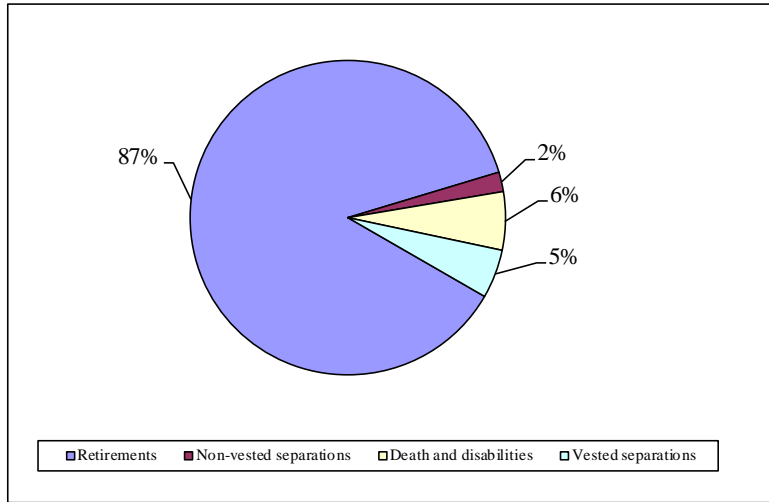


■ Active Members ■ Retirants and Beneficiaries

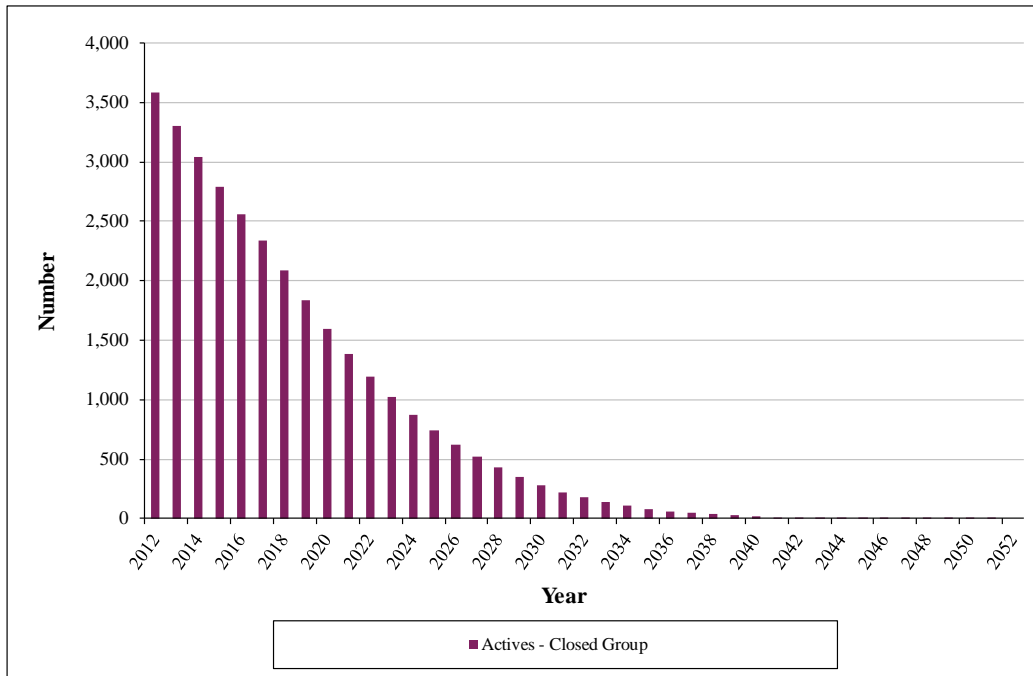
Retirement Allowances as %s of Active Pays



EXPECTED TERMINATIONS FROM ACTIVE EMPLOYMENT FOR CURRENT ACTIVE MEMBERS



The chart above shows the expected future development of the present population in simplified terms. The retirement system presently covers 3,587 active members. Eventually, 68 members are expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 3,306 members are expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 213 members are expected to become eligible for death-in-service or disability benefits. Shown below is a graph of projected active members remaining in the retirement system. It is projected that less than half of the current active population will be active by 2020.



COMMENTS AND CONCLUSION

Experience during the Past Year

Investment experience for the year ended June 30, 2012 was unfavorable with a market rate of return of (4.3)% which is 12.3% below the assumed 8.00% investment rate of return. Due to the 7-year smoothing of the current loss (as well as prior gains and losses), the recognized rate of return on the funding value of assets was 3.8%. Because of the past unfavorable market returns and the 7-year smoothing, the funding value of assets exceeds the market value by \$701 million. Unless the market recovers remarkably within a relatively short period of time, upward pressure on the employer rate can be expected in each of the next several years. If there are no experience gains during the next 7 years, the employer contribution rate could double during that time.

Annuity Reserve Fund

The Annuity Reserve Fund (ARF), as reported, was \$12.8 million higher than the accrued liabilities for Retirees and Beneficiaries. The Board approved a transfer of \$12 million from the Annuity Reserve Fund to the Pension Accumulation Fund in 2001, a transfer of \$5 million in 2005 and a transfer of \$22 million in 2011.

Employer Contribution Rate

The employer contribution rate increased from 23.14% of covered payroll last year to 30.59% of covered payroll this year. The System experienced actuarial losses this year primarily due to lower than assumed investment return on a funding (smoothed) value of assets basis. The Boards' funding policy is 1) to contribute full normal cost contributions when valuation assets exceed accrued liabilities and 2) to contribute the normal cost plus an amortization payment on the UAAL (based on a closed 29-year period) when accrued liabilities exceed valuation assets. As of June 30, 2012, the System is 96.10% funded so the computed employer contribution is above the employer normal cost. There are approximately \$701 million in net investment losses scheduled to be recognized over the next 6 years. On a market value basis, the fund is approximately 78.00% funded. If the market value of assets were used to determine the employer contribution rate as of June 30, 2012, the computed employer contribution rate would have been 63.56% of covered payroll. That rate is an estimate of where the employer contribution rate is expected to be at the end of the asset smoothing period (in 7 years), if there are no other gains or losses and the payroll remains stable (if payroll declines, the contribution rate will increase to obtain the same contribution dollars – see discussion on page 13 regarding closed plans and the computation of the required employer contributions).

Method Change

Effective with this valuation, a method change was made to align the valuation with the administrative procedures for calculating the post retirement COLA. Our understanding is that the post retirement COLA paid on each retiree's total benefit will be 2.25% multiplied by a ratio of service earned before the COLA rate went to zero to total service earned. For example, if a member retired with 25 years of service and earned 3 of those years after April 5, 2011 (or September 1, 2011 for DPOA members) then they would receive a compound COLA of 1.98% ($2.25\% * 22 / 25$), beginning on their first COLA anniversary date. In addition, the load for administrative expenses was increased (from 1.20% of pay to 2.50% of pay) to better reflect expected long term administrative expenses a percent of payroll.

Assets and Accrued Contributions

As of June 30, 2012, the annual benefits were approximately 10.80% of the market value of assets, including contribution receivables due from the City. Due to this relationship, failure to receive employer contributions on a timely basis could jeopardize the sustainability of the fund. We recommend that the accrued employer contributions be deposited into the fund as soon as possible.

COMMENTS AND CONCLUSION

Closed Plan

Due to the plan closing, we recommend that a plan be developed to:

- Reduce the asset smoothing period over the near term.
- Reduce the investment return assumption as the asset allocation is changed to meet changing cash-flow needs.
- Shorten the amortization of unfunded actuarial accrued liabilities over a period of time until it equals the average future working lifetime of the remaining active members.

Traditionally, we have shown the employer contribution rates as percents of payroll. For Fiscal Year 2014, that rate is 30.59%. We understand that the system applies that rate to the actual payroll during the covered period to determine the dollar contributions owed by the City. In a closed plan, this process can result in dollar contributions less than anticipated during the valuation (a contribution loss), due to the declining payroll. The amount of this loss can vary from year to year, but can be substantial during periods of contraction, following the valuation date. This is especially true for plans that have a lag between the valuation date and the contribution effective date, like the Police and Fire Retirement System. To avoid/minimize this loss, we recommend consideration of the following possible alternative administrative or actuarial methods:

- 1) Base dollar amount of the contribution on the normal cost rate multiplied by the actual payroll during the covered period and then add the dollar amount of the UAAL payment to determine the actual total contributions owed by the City. For FY 2014, this would be: $23.65\% \times \text{actual payroll} + \14.3 million , adjusted with interest at 8% if paid after 6/30/2014 (note that the normal cost of 22.74% show on page 3 is adjusted with $\frac{1}{2}$ year of interest: $23.65\% = 22.74\% * 1.04$);
- 2) Contribute the total dollar contribution estimated in the valuation. Page 2 shows that this amount is approximately \$63 million. A more precise number will be shown in future reports, if this method is selected.
- 3) Increase the contribution rates for anticipated decreases in payroll. For FY 2014, this would result in a total employer contribution rate of 34.23%, payable on 6/30/2014.

Methods and Assumption Review

Actuarial methods and assumptions were last formally reviewed (in aggregate) for the 5-year period ending June 30, 2007. The next review is scheduled to begin subsequent to the valuation and will cover the 5-year period ending June 30, 2012. The City Ordinance requires a formal review be performed every 5 years. This study will review economic assumptions (assumptions about future events affecting money values) and demographic assumptions (assumptions about future events that happen to members). In addition, we will be reviewing methods and assumptions for conformity with recent changes in the actuarial standards (such as the appropriate margin for future mortality improvement to include and the corridor around the market value as well as other areas of operation of the system that is modeled in the annual valuations).

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 2013-2014 fiscal year is 30.59% of covered payroll.

DATA FURNISHED FOR VALUATION

SUMMARY OF BENEFIT PROVISIONS (JULY 1, 2012)

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 - For all service earned up to April 5, 2011 for LSA members (September 1, 2011 for DPOA 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.

For all service earned after April 5, 2011 for LSA members (September 1, 2011 for DPOA members), 2.1% 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 - For all service earned up to April 5, 2011 for LSA members (September 1, 2011 for DPOA 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.

For all service earned after April 5, 2011 for LSA members (September 1, 2011 for DPOA members), 2.1% of AFC times each year of service, up to 35 years of service.

Members may elect to receive their accumulated contribution account in a lump sum after 25 years of service (20 years of service for eligible DPOA and DFFA members). 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. A member may elect that upon retirement or upon death before retirement either (i) a lump sum payment equal to 85% (100% for DPOA and DPCOA members) of the amount of his or her unused accumulated sick leave bank, or (ii) to have the 3-year average of 25% of the value of the accumulated unused sick leave bank added to his or her AFC. Any member electing the AFC adjustment option will also be paid a lump sum equal to the remaining value of the sick leave bank as provided in (i) above. Lump sum payments are not paid by the retirement system.

SUMMARY OF BENEFIT PROVISIONS (CONTINUED)

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 the old duty disability plan will receive 66-2/3% of final compensation payable to eligibility date for regular retirement.

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.

SUMMARY OF BENEFIT PROVISIONS (CONCLUDED)

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: For all service earned up to April 5, 2011 for LSA members (September 1, 2011 for DPOA members) pensions increase by 2.25% of the **current** pension amount each July 1. No cost-of-living adjustments for service earned after April 5, 2011 for LSA members (September 1, 2011 for DPOA members).

Member Contributions

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

DROP plan

Members with 25 years (20 years for DPOA members) of service may elect to participate in the DROP. When a DROP election is made, the member ceases to accrue any further age and service retirement benefits. Seventy five percent (75%) of the member's benefit (accrued to their DROP date) is contributed to a DROP account (a defined contribution account). At retirement the member is entitled to the balance in the DROP account and a monthly benefit equal to 100% of their benefit accrued to their DROP date, increased by any post-retirement increases that the member would have received, had the member been retired. Fire members must retire from the DROP plan at age 60. Participation in the DROP is limited to 10 years for LSA members electing to DROP after April 5, 2011.

Participation

Plan is closed to new members, effective April 5, 2011 for LSA and July 1, 2012 for DPOA.

ASSET INFORMATION FURNISHED FOR VALUATION

Reported Assets (Market Value)

Market Value - June 30, 2012	
Cash & equivalents	\$ 80,135,410
Receivables & accruals	16,185,265
Contributions receivable	49,760,229
Stocks	1,369,740,351
Bonds & government securities	642,880,961
Real estate	537,258,408
Private equity	84,185,928
Securities lending	309,769,129
Pooled investments	237,657,224
Capital assets	1,274,497
Accounts payable	(354,385,769)
Total Current Assets	\$ 2,974,461,633

ASSET INFORMATION USED FOR VALUATION

*Reserve Accounts**

Funds	Fund Balances	
	June 30, 2012 &	June 30, 2011
Annuity Savings	\$ 198,566,556	\$ 229,666,031
Annuity Reserve #	17,260,868	9,447,153
Total Annuity Funds	215,827,424	239,113,184
Pension Accumulation	(45,910,951)	124,574,896
Pension Reserve	2,804,974,749	2,745,818,143
Accrued Liability Fund Reserve	694,971,515	689,859,074
Survivor Benefit	5,596,867	5,394,571
Total Pension Funds	3,459,632,180	3,565,646,684
Total Fund Balances	\$3,675,459,604	\$3,804,759,868

Actual balance was reported to be \$31,447,153 as of June 30, 2011. Amount shown is net of \$22 million transfer to Pension Accumulation Fund.

*Revenues and Expenditures**

	Pension Funds &	Annuity Funds	Total Funds
Balance, July 1, 2011	\$3,565,646,684	\$ 239,113,184	\$3,804,759,868
Prior Valuation Audit Adjustment	0	0	0
Balance July 1, 2011 after Adjustment	3,565,646,684	239,113,184	3,804,759,868
Revenues			
Member Contributions	0	9,538,384	9,538,384
Employer Contributions	49,760,229	0	49,760,229
Recognized Investment Income	127,401,039	10,587,959	137,988,998
Transfers	229,392	(229,392)	0
Total	\$ 177,390,660	\$ 19,896,951	\$ 197,287,611
Expenditures			
Benefit Payments	278,104,785	0	278,104,785
Refund of Member Contributions	0	43,182,711	43,182,711
Administrative Expenses	5,300,379	0	5,300,379
Total	\$ 283,405,164	\$ 43,182,711	\$ 326,587,875
Balance, June 30, 2012	\$3,459,632,180	\$215,827,424	\$3,675,459,604
Funding Value Rate of Return	3.7%	4.8%	3.8%

* Excludes the Market Stabilization Fund.

FUNDING VALUE OF ASSETS

	2011	2012	2013	2014	2015	2016	2017
A. Funding Value Beginning of Year	\$ 3,853,279,381	\$ 3,804,759,868					
B. Market Value End of Year	3,380,091,601	2,974,461,633					
C. Market Value Beginning of Year	3,017,949,235	3,380,091,601					
D. Contributions During Year:							
D1. City Contributions (End of Year)	81,642,112	49,760,229					
D2. Member Contributions	10,453,905	9,538,384					
E. Expenses:							
E1. Benefits Paid During Year	339,301,840	321,287,496					
E2. Administrative Expenses	5,486,680	5,300,379					
F. Investment Income:							
F1. Market Total: B - C - D + E	614,834,869	(138,340,706)					
F2. Assumed Rate	8.0%	8.0%					
F3. Amount for Immediate Recognition	298,154,650	293,689,219					
F4. Amount for Phased-In Recognition: F1-F3	316,680,219	(432,029,925)					
G. Phased-In Recognition of Investment Income:							
G1. Current Year: F4/7	45,240,031	(61,718,561)					
G2. 1st Prior Year	(139,221,691)	45,240,031	\$ (61,718,561)				
G3. 2nd Prior Year		(139,221,691)	45,240,031	\$ (61,718,561)			
G4. 3rd Prior Year			(139,221,691)	45,240,031	\$ (61,718,561)		
G5. 4th Prior Year				(139,221,691)	45,240,031	\$ (61,718,561)	
G6. 5th Prior Year					(139,221,691)	45,240,031	\$ (61,718,561)
G7. 6th Prior Year						(139,221,691)	45,240,031
G8. Total Recognized Investment Gain	(93,981,660)	(155,700,221)	(155,700,221)	(155,700,221)	(155,700,221)	(155,700,221)	(16,478,528)
H. Total Interest Distributed - Current Year: (F3 + G8)	204,172,990	137,988,998					
I. Funding Value End of Year:							
I1. Preliminary Funding Value End of Year: A + D - E + H	3,804,759,868	3,675,459,604					
I2. Upper Corridor Limit 130% x B	4,394,119,081	3,866,800,123					
I3. Lower Corridor Limit 70% x B	2,366,064,121	2,082,123,143					
I4. Funding Value End of Year	3,804,759,868	3,675,459,604					
J. Difference Between Market & Funding Value: (B - I)	(424,668,267)	(700,997,971)					
K. Recognized Rate of Return: H / [1/2 (A + I4 - H)]	5.5%	3.8%					
L. Market Rate of Return: F1 / [C - 1/2 (E - D)]	21.3%	(4.3)%					
M. Ratio of Funding Value to Market Value	112.6%	123.6%					

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 7-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 six consecutive years, the Funding Value will become equal to Market Value.

RETIREES AND BENEFICIARIES JUNE 30, 2012
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*	7	\$ 22,594			69	\$ 35,808	76	\$ 58,402
20-24	1	1,726					1	1,726
25-29	2	3,593					2	3,593
30-34	3	4,648	24	\$ 71,762	5	8,696	32	85,106
35-39	8	13,621	49	150,418	9	15,331	66	179,370
40-44	23	26,934	77	240,769	11	18,006	111	285,709
45-49	146	360,329	107	305,332	11	18,997	264	684,658
50-54	236	590,189	119	321,749	17	29,814	372	941,752
55-59	625	1,700,132	204	544,291	40	72,551	869	2,316,974
60-64	1,343	4,141,460	451	1,068,395	48	78,793	1,842	5,288,648
65-69	1,234	3,524,131	402	929,513	38	63,014	1,674	4,516,658
70-74	748	1,987,570	155	350,989	22	35,232	925	2,373,791
75-79	439	1,011,855	65	162,853	13	25,997	517	1,200,705
80-84	560	1,258,820	87	210,186	29	53,323	676	1,522,329
85-89	606	1,252,812	74	176,580	24	46,227	704	1,475,619
90-94	230	432,994	23	58,522	7	12,698	260	504,214
95 & Over	54	101,227	4	10,428	2	4,098	60	115,753
Totals	6,265	\$16,434,635	1,841	\$4,601,787	345	\$518,585	8,451	\$21,555,007

* May include records with defective birth dates.

INACTIVE VESTED MEMBERS JUNE 30, 2012

Attained Age	No.	Estimated Annual Allowances
Under 40	36	\$ 582,341
40-44	39	673,073
45-49	33	691,444
50-54	21	513,661
55-59	13	292,754
60-64	15	366,261
65 & over	17	508,806
Totals	174	\$3,628,340

PRE-1969 RETIREES AND BENEFICIARIES JUNE 30, 2012
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*								
20-24								
25-29								
30-34	1	\$ 958	1	\$ 2,534			2	\$ 3,492
35-39	2	2,615					2	2,615
40-44	1	1,054					1	1,054
45-49	0	0					0	0
50-54	6	6,409					6	6,409
55-59	5	5,972			2	\$ 3,812	7	9,784
60-64	27	43,658	1	1,035	9	17,194	37	61,887
65-69	266	524,760	127	282,376	13	24,159	406	831,295
70-74	383	811,574	111	245,089	18	28,949	512	1,085,612
75-79	300	610,654	47	104,797	10	18,552	357	734,003
80-84	366	733,835	78	183,284	28	49,821	472	966,940
85-89	519	1,025,972	70	166,466	23	44,188	612	1,236,626
90-94	222	416,399	23	58,522	6	11,995	251	486,916
95 & Over	52	99,080	4	10,428	2	4,098	58	113,606
Totals	2,150	\$4,282,940	462	\$1,054,531	111	\$202,768	2,723	\$5,540,239

* May include records with defective birth dates.

Includes survivor beneficiaries of service and disability retirees.

ACTIVE MEMBERS JUNE 30, 2012
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	30							30	\$ 1,231,765
25-29	117	27	1					145	6,534,859
30-34	78	61	160	5				304	15,598,404
35-39	38	33	286	154				511	27,807,802
40-44	22	15	276	326	25	1		665	37,541,444
45-49	9	12	108	147	61	96		433	25,359,283
50-54	5	2	38	50	34	144	4	277	16,691,359
55-59		2	6	19	18	101	39	185	11,587,335
60		1			1	12	12	26	1,675,151
61					1	9	9	19	1,217,374
62				1	1	3	3	8	478,845
63		1	2			2	9	14	848,624
64					1	1	8	10	591,402
65	1				1		4	6	379,188
68							1	1	53,237
69							2	2	121,232
70							2	2	121,682
73							2	2	121,232
Totals	300	154	877	702	143	369	95	2,640	\$147,960,218

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									
25-29	1	8	1					10	\$ 460,788
30-34	5	37	50	1				93	4,853,700
35-39	1	33	90	18				142	7,670,494
40-44	2	12	87	70	48	1		220	12,720,162
45-49	1	3	27	48	103	42	1	225	14,377,889
50-54		1	15	21	62	56	8	163	10,676,538
55-59		1	1	3	13	31	42	91	6,837,514
60						1	2	3	242,975
Totals	10	95	271	161	226	131	53	947	\$57,840,060

**TOTAL ACTIVE MEMBERS JUNE 30, 2012
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	30							30	\$ 1,231,765
25-29	118	35	2					155	6,995,647
30-34	83	98	210	6				397	20,452,104
35-39	39	66	376	172				653	35,478,296
40-44	24	27	363	396	73	2		885	50,261,606
45-49	10	15	135	195	164	138	1	658	39,737,172
50-54	5	3	53	71	96	200	12	440	27,367,897
55-59		3	7	22	31	132	81	276	18,424,849
60		1			1	13	14	29	1,918,126
61					1	9	9	19	1,217,374
62				1	1	3	3	8	478,845
63		1	2			2	9	14	848,624
64					1	1	8	10	591,402
65	1				1		4	6	379,188
67									
68							1	1	53,237
69							2	2	121,232
70							2	2	121,682
72									
76									
Totals	310	249	1,148	863	369	500	148	3,587	\$205,800,278

	Group Averages		
	Police	Fire	Total
Age:	42.4 years	44.5 years	42.9 years
Service:	15.7 years	18.4 years	16.4 years
Annual Pay:	\$56,046	\$61,077	\$57,374

**RECONCILIATION OF REPORTED DATA
AS OF JUNE 30, 2012**

Active Data

A) Number of records reported on data file:	3,842
B) Number of records excluded due to inactive status in "EmployeeMaster" file	255
C) Number defective:	<u>-</u>
D) Number valued:	3,587

Retired Data

A) Number of records reported on data file #:	37,883
B) Number not in P/F plan #:	23,760
C) Number not currently in receipt:	5,672
D) Number defective:	<u>-</u>
E) Number valued:	8,451

Deferred Data

A) Number of records reported on data file:	195
B) Number of records with reported service less than 8 years:	18
C) Number defective:	<u>3</u>
D) Number valued:	174

For retiree data, file contains members in Police and Fire Retirement system and General Retirement System.

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

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)		
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*&	4,307,194,763	3,896,814,229	(410,380,534)	110.5%	230,173,964	-
2008#	4,316,263,291	4,071,053,752	(245,209,539)	106.0%	232,812,606	-
2009	3,945,205,453	4,221,291,045	276,085,592	93.5%	231,795,528	119.1 %
2010#*	3,853,279,381	3,767,364,201	(85,915,180)	102.3%	228,829,999	-
2011	3,804,759,868	3,808,642,533	3,882,665	99.9%	220,461,691	1.8 %
2012#	3,675,459,604	3,822,676,002	147,216,398	96.1%	205,800,278	71.5 %

* Plan amended.

After changes in actuarial assumptions and/or methods.

@ After POC transfer.

& 2005 and 2006 assets were revised following the June 30, 2006 valuation. 2007 assets were revised after the June 30, 2007 valuation.

SCHEDULE OF EMPLOYER CONTRIBUTIONS

Fiscal Year Ended June 30	Reported Employer Contributions	
	From Pension Obligation Certificates (POCs)	Employer Contributions Other than from POCs
2000		\$ 19,972,058
2001		14,443,382
2002		8,449,645
2003		66,843,029
2004		69,475,202
2005	\$ 630,829,189	51,602,596
2006&		57,766,542
2007		57,423,366
2008		33,934,636
2009@		36,151,057
2010		32,808,485
2011		81,642,112
2012@		49,760,229

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

@ Contribution receivable.

GASB STATEMENT NO. 25 REQUIRED SUPPLEMENTARY INFORMATION

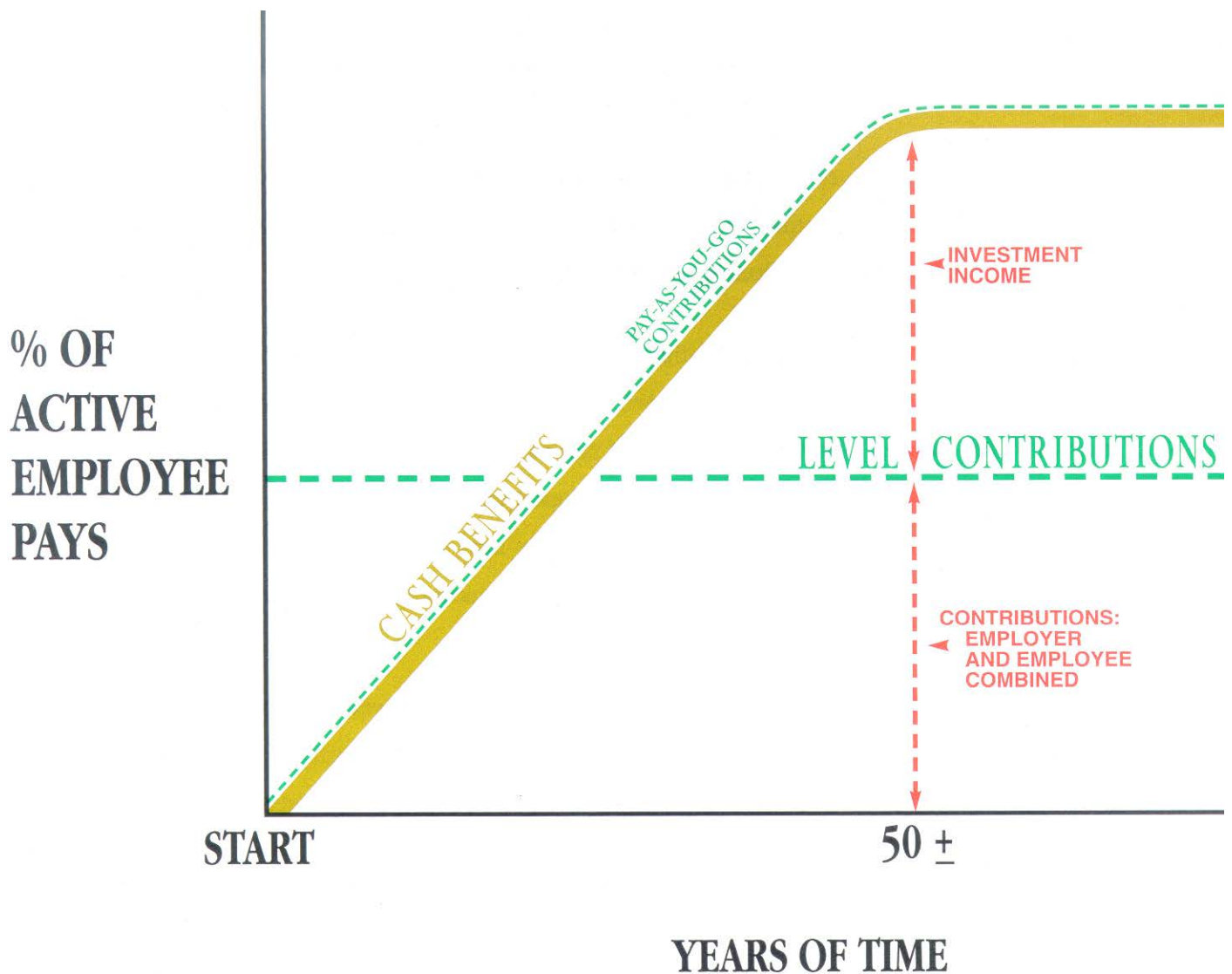
The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	June 30, 2012
Actuarial cost method	Entry Age
Amortization method	Level dollar, closed
Remaining amortization period	29 years
Asset valuation method	7-year smoothed market
Actuarial assumptions:	
Investment rate of return	8.0%
Projected salary increases*	5.0% - 9.2%
*Includes inflation at	0% for two years; 4% thereafter
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.

Membership of the plan consisted of the following at June 30, 2012, the date of the latest actuarial valuation:

Retirees and beneficiaries receiving benefits	8,451
Terminated plan members entitled to but not yet receiving benefits	174
Active plan members	3,587
Total	12,212

FINANCIAL PRINCIPLES



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 . . .

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.

APPENDIX

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

ASSUMPTION REVIEW

As required by City Ordinance, assumptions are formally reviewed every 5 years and changes are recommended as experience emerges. The results of this study (including the actuary's recommendation) are detailed in a report called an Experience Study. The last Experience Study covered the 5-year period ending June 30, 2007.

ECONOMIC ASSUMPTIONS

The investment return rate used in the valuation was 8.0% per year, compounded annually (net after investment 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 8.0% total investment return rate translates to an assumed real rate of return of 4.0% over wage inflation. This assumption was first used for the June 30, 2010 valuation. It was adopted by the Board outside of the routine 5-year experience studies at the request of the Employer.

Pay increase assumptions for individual active members are shown on page 33. Part of the assumption for each age is for a merit and/or seniority increase, and the other recognizes wage inflation (assumed to be 0% for the next 2 years and 4% per year thereafter).

NON-ECONOMIC ASSUMPTIONS

The number of active members is assumed to decrease over time since the Plan is closed.

The mortality table used to measure retired life mortality was 95% of the RP-2000 Combined Table for males and 100% of the RP-2000 Combined Table set back 2 years for females. No provision is currently made for future improvements in mortality after the measurement date. Related values are shown on page 33. This table was first used for the June 30, 2008 valuation. For disabled members, a 10 year set forward of the healthy rates was used to measure post-retirement mortality.

The probabilities of age/service retirement for members eligible to retire are shown on page 34. Probabilities for service eligibility were first used for the June 30, 2008 valuation.

The probabilities of separation from service (including *death-in-service*) are shown for sample ages on page 35. These probabilities were first used for the June 30, 2008 valuation.

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

JUNE 30, 2012

Marriage Assumption:	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. This assumption is high to account for potential dependent children/dependent parent death benefits. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing:	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.
Decrement Timing:	Decrements are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and exact fractional service nearest the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal do not operate during retirement eligibility.
Incidence of Contributions:	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.
Longevity in AFC:	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%.
Unused Sick Leave Payout:	The normal cost was increased by 1.0% of payroll to account for the inclusion of a percentage of unused sick leave banks in the determination of AFC.
Post-Retirement COLA:	Active members are assumed to receive a 1.9% COLA rather than 2.25% because the annuity portion is not subject to the COLA. Post retirement increases for retired members were based on the plan in effect at retirement. For the pre-69 plan members, future COLA's are assumed to be the same as wage inflation for active members. The COLA rate is prorated by the ratio of COLA eligible service to total service at retirement.
FAC Period:	1 year FAC period was used.
Disability Change Age:	The duty disability benefit is assumed to change at normal retirement age.
Administrative Expense Load:	2.50% of pay is added to the normal cost to account for administrative expenses.
Miscellaneous Loads:	Normal retirement accrued liability (excluding DROP members) was increased by 3% for service purchases. Active accrued liability (excluding DROP members) was increased by 1% to approximate the effect of incomplete service data.
DROP Assumption:	Members are assumed to DROP upon first eligibility and stay in the DROP program for 5 years.

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 dollar 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 seven year period. (Adopted for the 6-30-10 actuarial valuation.)

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

For valuation purposes, members are categorized as DPOA, DFFA or LSA based on class codes provided by the retirement system and are primarily used in the valuation to determine normal retirement eligibility (20&Out versus 25&out). Therefore, counts in the valuation may not represent actual membership in the respective associations.

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

Service	Salary Increase Assumptions for an Individual Member		
	Merit & Seniority	Base (Economic)	Increase Next Year
5	5.20%	4.00%	9.20%
10	1.70%	4.00%	5.70%
15	1.00%	4.00%	5.00%
20	1.00%	4.00%	5.00%
25	1.00%	4.00%	5.00%
30	1.00%	4.00%	5.00%
35	1.00%	4.00%	5.00%
Ref			306 + 4.00%

Select and ultimate wage inflation rates are assumed to be 0% for the next 2 years and 4% thereafter.

SINGLE LIFE RETIREMENT VALUES BASED ON RP-2000 COMBINED & 8.0% INTEREST 95% OF MALE RATES SET-BACK 0 YEARS 100% OF FEMALE RATES SET-BACK 2 YEARS

Sample Attained Ages	Present Value of \$1.00 Monthly Increasing "X"% Annually After Retirement						Future Life Expectancy (years)	
	4.0% Compound		2.25% Simple		2.25% Compound		Men	Women
	Men	Women	Men	Women	Men	Women		
45	\$ 224.52	\$ 236.82	\$ 173.21	\$ 178.99	\$ 180.46	\$ 187.39	35.97	40.28
50	208.32	222.62	164.68	172.13	170.60	179.24	31.24	35.49
55	189.54	206.05	153.76	163.26	158.37	169.04	26.61	30.77
60	168.51	187.03	140.39	152.02	143.78	156.51	22.16	26.17
65	145.94	166.04	124.89	138.53	127.22	141.84	18.00	21.78
70	122.74	144.03	107.85	123.36	109.33	125.65	14.23	17.75
75	99.47	121.39	89.64	106.67	90.50	108.15	10.88	14.08
80	77.33	98.98	71.33	89.14	71.77	90.01	8.02	10.85
Ref:	506 x 0.95	507 x 1.00	506 x 0.95	507 x 1.00	506 x 0.95	507 x 1.00		

PROBABILITIES OF SERVICE RETIREMENT

Service	Percent of Eligible Active Members Retiring Within Next Year			
	Police		Fire	
19	25%		15%	
20	18%		12%	
21	18%		12%	
22	18%		12%	
23	18%		12%	
24	18%	35%	12%	15%
25	18%	25%	12%	15%
26	18%	20%	12%	12%
27	18%	20%	12%	12%
28	18%	20%	12%	12%
29	18%	18%	15%	12%
30	18%	18%	15%	12%
31	18%	18%	15%	12%
32	20%	20%	15%	12%
33	25%	25%	20%	20%
34	30%	30%	25%	20%
35	30%	30%	30%	30%
36	30%	30%	30%	35%
37	30%	30%	30%	35%
38	30%	30%	30%	35%
39	30%	30%	30%	35%
40	100%	100%	100%	100%
Ref	1548	823	1549	1639

Age	Percent of Eligible Active Members Retiring Within Next Year	
	Police	Fire
60	25%	100%
61	25%	100%
62	25%	100%
63	22%	100%
64	20%	100%
65	18%	100%
66	15%	100%
67	15%	100%
68	15%	100%
69	15%	100%
70	100%	100%
Ref	1638	1

Members eligible for 20 & out are assumed to be first eligible for normal retirement after 19 years of service due to their ability to purchase service. Members eligible for 25 & out are assumed to be eligible for normal retirement after 25 years of service due to their ability to purchase service.

PROBABILITIES OF SEPARATION

Sample Ages	Years of Service	% of Active Members Separating Within Next Year			
		Withdrawal		Death	
		Police	Fire	Male	Female
ALL	0	8.50%	5.00%		
	1	7.50%	4.00%		
	2	6.00%	3.00%		
	3	5.00%	2.00%		
	4	4.50%	2.00%		
25	5 & Over	4.50%	1.96%	0.03%	0.01%
30		3.30%	1.62%	0.03%	0.02%
35		2.30%	1.11%	0.06%	0.03%
40		1.70%	0.77%	0.08%	0.04%
45		1.50%	0.60%	0.11%	0.07%
50		1.10%	0.51%	0.16%	0.11%
55		0.80%	0.51%	0.27%	0.17%
60		0.80%	0.51%	0.51%	0.29%
Ref		566 207	230 113 x .85	506 x .75	507 x .75

Sample Ages	% of Active Members Becoming Disabled Within Next Year			
	Police		Fire	
	Ordinary	Duty	Ordinary	Duty
25	0.06%	0.13%	0.07%	0.34%
30	0.07%	0.19%	0.08%	0.52%
35	0.08%	0.34%	0.09%	0.90%
40	0.11%	0.49%	0.12%	1.30%
45	0.16%	0.73%	0.18%	1.92%
50	0.47%	1.16%	0.53%	3.06%
55	0.73%	1.96%	0.82%	5.18%
60	0.83%	2.82%	0.94%	7.47%
Ref	105 x 0.75	90 x 0.85	105 x 0.85	90 x 2.25

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.

May 22, 2013

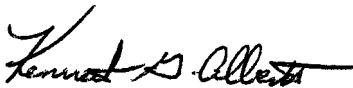
Mr. David Cetlinski
Executive Secretary
The Police and Fire Retirement System of the
City of Detroit
2 Woodward Avenue, Suite 908
Detroit, MI 48226

Re: June 30, 2012 Actuarial Valuation

Dear Dave:

Enclosed are 20 copies of the report of the June 30, 2012 annual actuarial valuation.

Sincerely,



Kenneth G. Alberts

KGA:bd
Enclosures

cc: Cynthia Thomas, City of Detroit Retirement Systems
Norman Jones, GRS
Judith Kermans, GRS