Actuarial Valuation Report
for the
Fire and Police Employees' Retirement System
of the City of Baltimore

as of June 30, 2012

Produced by Cheiron

October 2012

CHEIRON Classic Values, Innovative Advice

Table of Contents

October 16, 2012

Board of Trustees
Fire and Police Employee's Retirement System
of the City of Baltimore
7 East Redwood Street, 18th Floor
Baltimore, Maryland 21202-3470

Dear Members of the Board:

We are pleased to submit the June 30, 2012 actuarial valuation of the Fire and Police Employees' Retirement System of the City of Baltimore. This report contains information on System assets, liabilities, and contributions as well as discloses employer contribution levels.

In preparing our report, we relied without audit, on information (some oral and some written) supplied by the System's staff. This information includes, but is not limited to, plan provisions, employee data, and financial information. The actuarial assumptions reflect our understanding of the likely future experience of the System, and the assumptions as a whole represent our best estimate in cooperation with the Board's views for the future experience of the System. The results of this report are only applicable to the City's contribution for Fiscal Year 2014 and rely on future plan experience conforming to the underlying assumptions. To the extent that actual plan experience deviates from the underlying assumptions, the results will vary accordingly.

We hereby certify that, to the best of our knowledge, this report and its contents, which are work products of Cheiron, Inc., are complete and have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This report was prepared solely for the Police and Fire Employees' Retirement System of the City of Baltimore for the purposes described herein, except that the plan auditor may rely on this report solely for the purpose of completing an audit related to the matters herein. This valuation report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

Sincerely,
Cheiron

Margaret Tempkin, FSA, MAAA
Principal Consulting Actuary

Fiona E. Liston, FSA, MAAA
Principal Consulting Actuary

FOREWORD

Cheiron is pleased to provide the annual actuarial valuation report of the **Fire and Police Employees' Retirement System of the City of Baltimore** as of June 30, 2012. The purpose of this report is to:

1) **measure and disclose**, as of the valuation date, the financial condition of the System,

2) **report** on past and expected financial trends, and

3) **determine** the recommended contributions for Fiscal Year 2014.

An actuarial valuation establishes and analyzes System assets and liabilities on a consistent basis, and traces the progress of both from one year to the next. It includes measurement of the System's investment performance as well as an analysis of actuarial liability gains and losses. This valuation report is organized as follows:

Section I presents a summary of the valuation and compares this year's results to last year's results.

Section II contains exhibits relating to the valuation of assets.

Section III shows the various measures of liabilities and required contributions and presents an analysis of the experience gains and losses over the past year and the source of changes to the unfunded actuarial accrued liability.

Section IV develops the City contribution rate determined using actuarial techniques.

The appendices to this report contain a summary of the System's membership at the valuation date, a summary of the major provisions of the System, and the actuarial methods and assumptions used in the valuation.

In preparing our report, we relied without audit, on information (some oral and some written) supplied by the Retirement System's Office. This information includes, but is not limited to, the plan provisions, employee data, and financial information.

The actuarial assumptions reflect our understanding of the likely future experience of the System, and the assumptions as a whole represent our best estimate for the future experience of the System. The results of this report are dependent upon future experience conforming to these assumptions. To the extent that future experience deviates from the actuarial assumptions, the true cost of the Plan could vary from our results.

SECTION I
SUMMARY

General Comments

This is the first actuarial valuation report prepared for the System by Cheiron. The results presented throughout this report under the heading June 30, 2011 are those produced by the System's former actuary. Cheiron was able to reproduce the 2011 results as a first step towards working on the 2012 numbers. We also reviewed an experience study that was performed by the prior actuary and recommended some changes to the assumption a result of that work. The Board of Trustees took action to accept those changes which formed the basis for this report.

In addition to the changes listed in Appendix C, there were two additional changes in procedure that were adopted by the Board in conjunction with Cheiron's recommendation. The previous development of actuarial assets included an addition of the employer contribution amount derived in the prior valuation and an adjustment for future costs under Ordinance 98-319. The smoothing method will no longer include these adjustments.

The City made additional contributions of $7.8 million all of which was used to reduce the System's underfunding. The System continues to recognize the negative balance in the Benefit Improvement Fund (BIF), the Employer Reserve Fund (ERF) and the Minimum Stabilization Fund (MSF).

The employer's annual contribution to this System is determined as the sum of the normal cost rate plus an amortization of the System's unfunded liability plus a provision for expenses. The employer contribution rate will change when benefits are increased or modified or assumptions are changed. The rate also changes in response to gains and losses on either the investment side or in the measurement of liability. Section III of this report contains a detailed reconciliation of the System's funded status as of June 30, 2011 versus the status as of June 30, 2012.

The key results of the June 30, 2012 actuarial valuation are as follows:

- The total recommended contribution increased from $102,165,359 for FY 2013 to $113,810,244 for FYE 2014 as a reflection of the prior year's experience and increased unfunded actuarial liability (UAL) as of June 30, 2012. The City's portion of the contribution for FY 2014 is $113,003,943 compared to $101,291,889 for FY 2013.

- This report reflects assumption changes adopted by the Board of Trustees based on results from the four-year experience study covering the period from July 1, 2006 through June 30, 2010. Some of the assumption changes regarding interest rates defined by the City of Baltimore Code will require changes to the law. However, those changes have been implemented in preparation of this valuation report. The assumption and method changes reflected in the results of our valuation are listed in Appendix B.

- Investments earned 3.85% on a market value basis. The expected rate of return for the June 30, 2012 period was 8.00%, resulting in an additional investment loss of $87 million.

- The actuarial asset value return was 0.34%, which produced a net loss of $196 million to the Fund this year when measured against the prior year's expected return of 8.00%.

SECTION I
SUMMARY

- The unfunded actuarial liability increased from $559 million on June 30, 2011 to $713 million on June 30, 2012, due to the investment loss, a liability gain of $20 million, and the combined impact of a change in assumptions and the change in actuarial systems. The assumption change increased the liabilities by $33 million, while the change in actuarial systems reduced liability by $30 million. The Plan's funded ratio decreased from 82% to 78%.

SECTION I
SUMMARY

The tables below provide details on the development of the City's contribution, together with the corresponding figures from the June 30, 2011 report.

Table I-1
Valuation Summary

		2011 Valuation Applies to FY 2013 Amount	2011 Valuation Applies to FY 2013 % of Pay	2012 Valuation Applies to FY 2014 Amount	2012 Valuation Applies to FY 2014 % of Pay
1.	**Contributions**				
	Total Normal Cost	$ 59,977,703	21.83%	$ 63,571,853	22.38%
	Expense Load	7,423,724	2.70%	4,260,102	1.50%
	Expected Employee Contributions	(25,719,680)	(9.36%)	(28,400,682)	(10.00%)
	Normal Cost	$ 41,681,747	15.17%	$ 39,431,273	13.88%
	Amortization of Unfunded Actuarial Liability	52,115,648	18.97%	65,444,776	23.04%
	Adjustment Due to City-Only Excess Contributions	(8,609)	0.00%	N/A	N/A
	Interest to Beginning of Next FY	7,503,103	2.73%	8,127,894	2.86%
	Total Lump Sum Cost	$ 101,291,889	36.86%	$ 113,003,943	39.78%
2.	**Unfunded Liabilities**				
	Actuarially Liability				
	Active	$ 1,039,627,632		$ 1,048,984,213	
	Retirees and dependents	2,032,074,529		2,104,836,516	
	Terminated vested	0		1,865,471	
	Total	$ 3,071,702,161		$ 3,155,686,200	
	Allocated Actuarial Value of Assets	$ 2,519,088,717		$ 2,450,269,949	
	Unfunded Actuarial Liability	$ 552,613,444		$ 705,416,251	

The adjustment for expected employee contributions is another minor change from how the former actuary developed the contribution amount. The 2011 number was based on a 4% increase to the payroll figure and yet the contribution rate used the unadjusted payroll. The 2012 number is based on the same payroll as is used to develop the contribution rate, that is, the unadjusted payroll figure.

SECTION I
SUMMARY

The following tables summarize changes in plan membership over the past year.

Table I-2
Active Membership Summary

	Active Members (City & State)		
	2011	**2012**	**% Increase**
Active members	4,575	4,624	1.07%
Total payroll	$ 275,647,861	$ 284,601,473	3.25%
Average salary	$ 60,251	$ 61,549	2.15%
Average age	39.14	39.23	0.23%
Average service	12.64	12.73	0.71%

Table I-3
Inactive Membership Summary

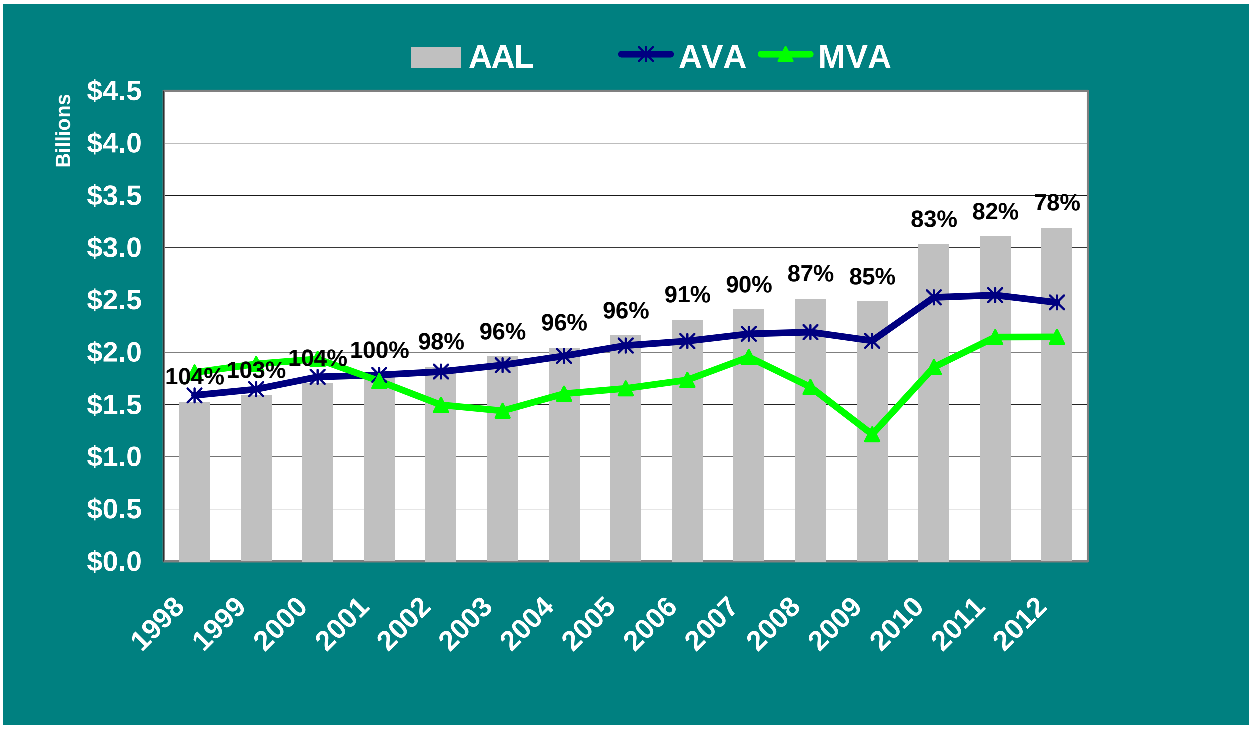
	Number of Retirees			Average Annual Benefit Amount		
	2011	**2012**	**% Increase**	**2011**	**2012**	**% Increase**
Normal Service Retirement	3,619	3,634	0.4%	$37,002	$37,745	2.0%
Discontinued Service	13	13	0.0%	31,138	31,186	0.2%
Non-Line-of-Duty Disability	280	276	-1.4%	18,587	18,576	-0.1%
Line-of-Duty Disability	724	734	1.4%	33,133	33,789	2.0%
Beneficiaries of Above	1,233	1,256	1.9%	15,829	16,688	5.4%
Non-Line-of-Duty Death	154	151	-1.9%	21,080	21,925	4.0%
Line-of-Duty Death	77	72	-6.5%	39,798	40,791	2.5%
Total	**6,100**	**6,136**	**0.6%**	**$31,038**	**$31,732**	**2.2%**

SECTION I
SUMMARY

Historical Trends

It is important to take a step back from these latest results and view them in the context of the System's recent history. Below we present a series of charts which display key factors in the valuations of the last ten years.

Assets and Liabilities



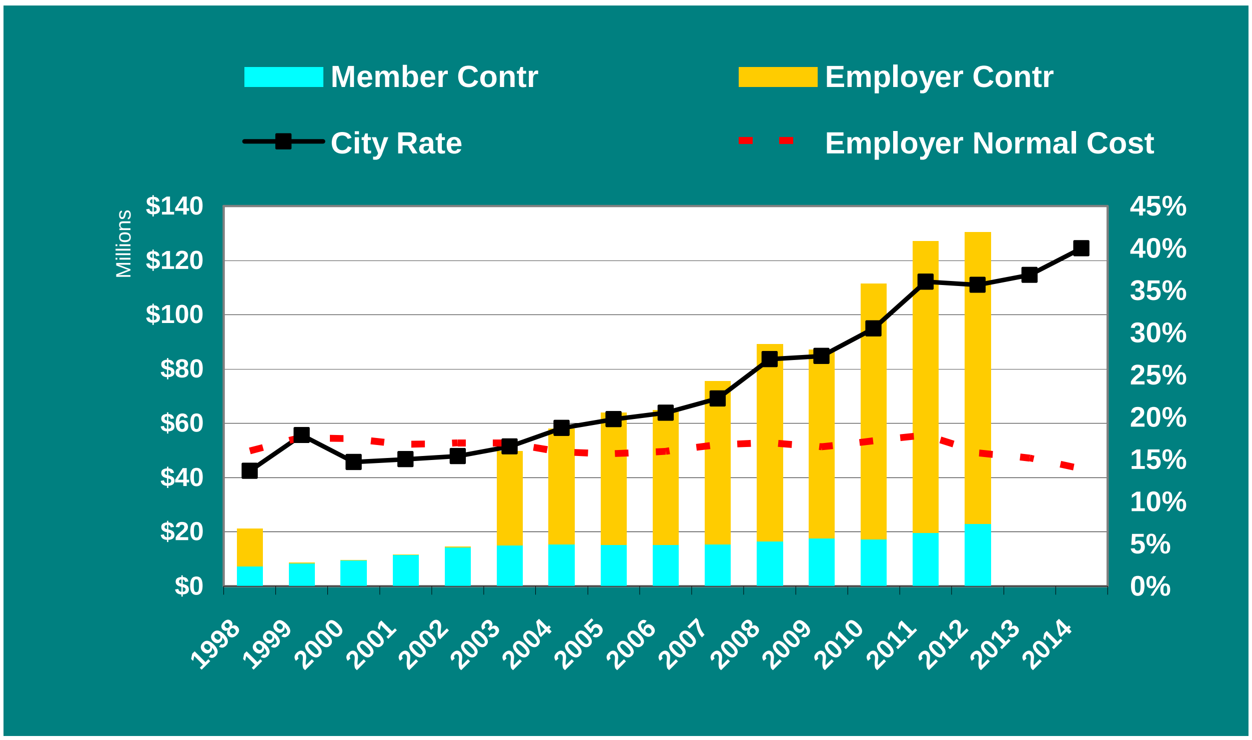
The bars represent the liability measured in this report for funding purposes. We compare the actuarial assets to this measure of liability in developing the funded percent. These are the percentages shown in the graph along the top of each bar. As you can see, the System had its highest funded percentage in the late 90's, when the ratio was over 100%. The two market declines in 2000 – 2002 and in 2007 – 2009 caused declines in the funded ratio. The liability and assets shown in 2010 and later include the former BIF, ERF, and MSF funds and their liability.

SECTION I
SUMMARY

Contribution Rates

The stacked bars in this graph show the contributions made by the City, State and members and are read using the left-hand scale. The black line shows the City's contribution rate as a percent of payroll and is read using the right-hand scale. There are two more years of contribution rates shown since we already know the rates in effect for Fiscal Years 2013 and 2014, but we will not know the actual dollar amount contributed until the close of those years.

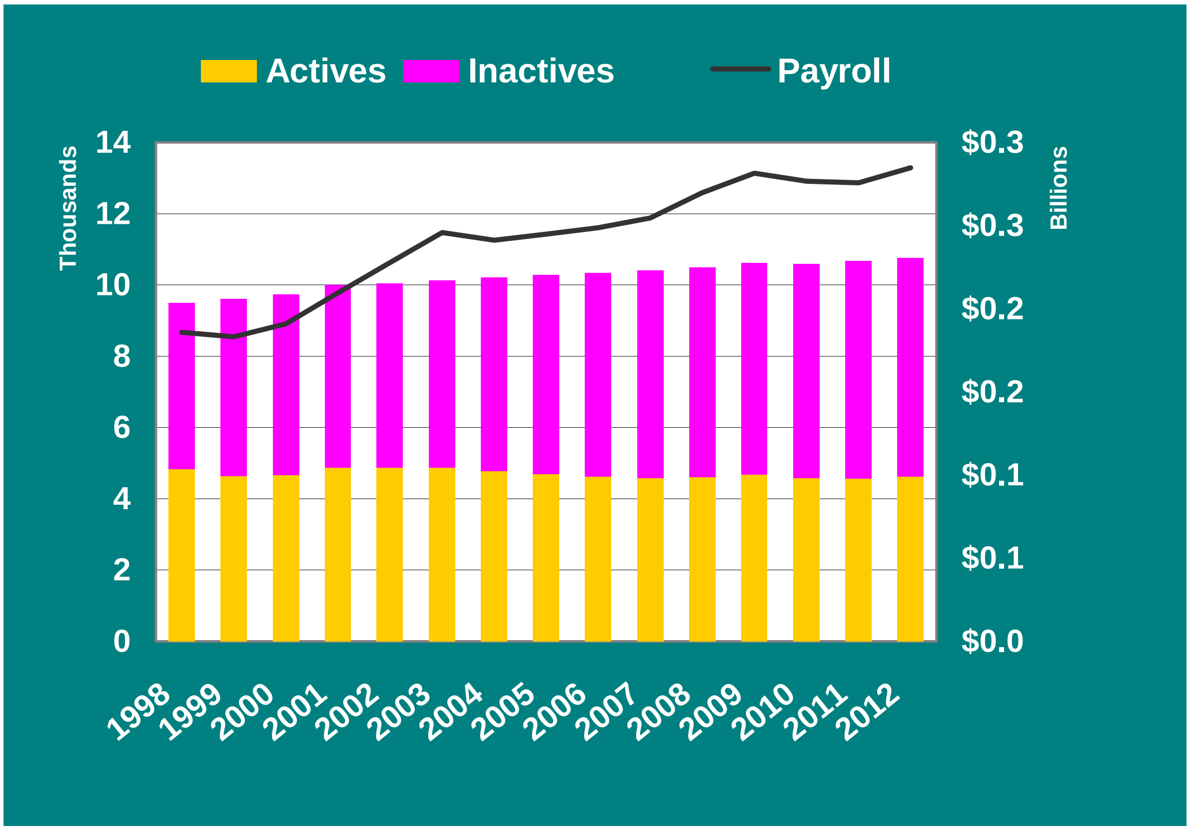
The red line shows the portion of the overall normal cost that is paid by the employer rather than the members. The normal cost measures the value of benefits to be accrued in the coming year. The employer-paid portion decreases over the period FY 2011 through FY 2014.



SECTION I
SUMMARY

Participant Trends

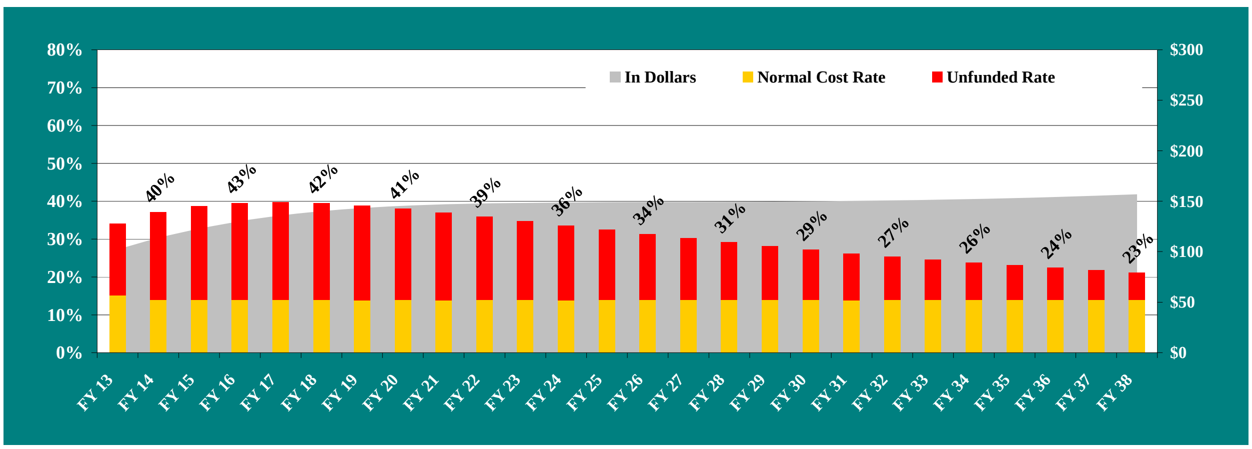
The following chart shows that the number of actives covered by the Plan has remained relatively stable over period shown. The number of inactive participants has increased as more participants take retirement. The black line shows the total covered payroll over the period. Contributions are made as a percent of payroll so changes in this key statistic have an impact on System funding.



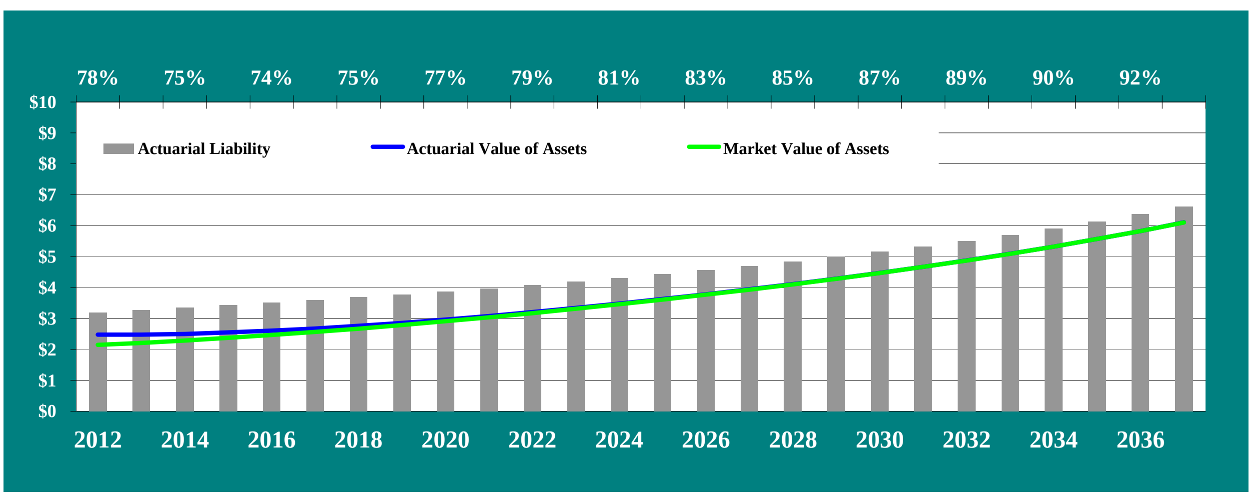
SECTION I
SUMMARY

Base Line Projections

The charts on this page show the expected progress of the System's funding status over the next 25 years measured in terms of the employer contribution rate and the funding ratio assuming the long-term return rate of 7.75%. The first chart below shows that the employer contribution rate is projected to first increase as the balance of the 2008/2009 investment loss and the wind-up of the BIF/ERF/MSF balances are included in the actuarial asset value. The rate then declines as a percent of payroll as the unfunded actuarial liability (UAL) is paid down, if all actuarial assumptions are met, including the 7.75% anticipated investment return assumption. The shaded area shows the dollar amount of employer contributions projected over this period and includes the assumption that covered payroll increases by 3.75% per year.



The next chart compares assets and liabilities and shows that if all actuarial assumptions are exactly met, the Plan's funded ratio shown along the top of the graph is projected to improve from the current level of 78% to 92% over the period shown.



SECTION II
ASSETS

Pension plan assets play a key role in the financial operation of the System and in the decisions the Trustees may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact upon benefit levels, employer contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on Plan assets including:

- Disclosure of Plan assets at June 30, 2012,
- Statement of the changes in market values during the year,
- Development of the actuarial value of assets, and
- An assessment of investment performance.

Disclosure

The market value of assets represents "snap-shot or cash-out" values which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are usually not suitable for budgeting current year contributions.

The actuarial values are market values which have been smoothed; they are used for evaluating the System's ongoing liability to meet its obligations.

Current methods employed by this System set the actuarial value equal to the market value, adjusted for a five-year phase-in of experience gains and losses. There is also a ten-year recognition of the remaining balances of the BIF, ERF and MSF. There are two years left in this recognition.

SECTION II
ASSETS

The assets below are based upon unaudited financial data furnished by the Retirement System's Office. The change in market value of assets of the six funds during the valuation year ending June 30, 2012 is summarized below.

Table II-1
Assets of the Plan as of June 30, 2012

	Annuity Savings Fund	Annuity Reserve Fund	Pension Accumulation Fund	Pension Reserve Fund	Paid Up Benefit Fund	Contingency Reserve Fund	Total (MV)
Fund Balance on 06/30/2011	$ 247,518,595	$27136315620	$ 60,380,367	$ 1,579,134,378	$(16,099,297)	$ 1,707,704	$ 2,144,004,903
Ordinance Transfer	$ 0	$ 0	$ 0	$ (14,391,593)	$ 16,099,297	$(1,707,704)	$ 0
Actuarial Transfer	$ 0	$ 17,100,264	$(221,433,941)	$ 204,333,677	$ 0	$ 0	$ 0
Adjusted Fund Balance on 06/30/2011	$ 247,518,595	$ 288,463,420	$(161,053,574)	$ 1,769,076,462	$ 0	$ 0	$ 2,144,004,903
Contributions							
Member	$ 22,866,939	$ 0	$ 0	$ 0	$ 0	$ 0	$ 22,866,939
City/State	$ 0	$ 0	$ 107,488,403	$ 0	$ 0	$ 0	$ 107,488,403
Net Investment Income							
Interest, Dividends, and Realized Capital Gains	$ 8,163,211	$ 0	$ 91,270,570	$ 0	$ 41,845,321	$ 2,571,428	$ 143,850,530
Unrealized Gains (Losses)	$ 0	$ 0	$ (87,425,618)	$ 0	$ 31,294,821	$ 370,517	$ (55,760,280)
Expenses	$ 0	$ 0	$ (6,665,840)	$ 0	$ (73,497)	$ (416,465)	$ (7,155,802)
Total Investment Income	$ 8,163,211	$ 0	$ (2,820,888)	$ 0	$ 73,066,645	$ 2,525,480	$ 80,934,448
Net Fund Transfers (Annuities Awarded)	$ (14,163,233)	$ 14,181,226	$ (17,993)	$ 0	$ 0	$ 0	$ 0
Payments of Benefit & Refunds	$ (2,609,208)	$ (26,200,646)	$ (9,757,917)	$ (130,701,744)	$(36,324,216)	$ 0	$ (205,593,731)
Administrative Expenses	$-	$ 0	$ (3,672,958)	$ 0	$ 0	$ 0	$ (3,672,958)
Fund Balance on 06/30/2012	$ 261,776,304	$ 276,444,000	$ (69,834,927)	$ 1,638,374,718	$ 36,742,429	$ 2,525,480	$ 2,146,028,004
Ordinance Transfers	$ 0	$ 0	$ 0	$ 39,267,909	$(36,742,429)	$(2,525,480)	$ 0
Actuarial Transfers	$ 0	$ 26,364,830	$(176,779,750)	$ 150,414,920	$ 0	$ 0	$ 0
Adjusted Fund Balance on 06/30/2012	$ 261,776,304	$ 302,808,830	$(246,614,677)	$ 1,828,057,547	$ 0	$ 0	$ 2,146,028,004

SECTION II
ASSETS

The chart below shows the calculation of investment gain/loss. On market value, the Fund earned a 3.85% return amounting to total investment income of $80,934,448 during FY 2012, resulting in a net System asset loss on a market value basis of $87.4 million.

Table II-2
Development of Investment Gain / (Loss)

1.	Market Value of Assets as of 6/30/2011	$ 2,144,004,903
2.	Market Value of Assets as of 6/30/2012	$ 2,146,028,004
3.	Earnings During 7/30/2011 to 6/30/2012 (Excluding Investment Expenses)	$ 80,934,448
4.	Mean Assets Half of [1. + 2. - 3.]	$ 2,104,549,230
5.	Investment return 2011-2012 (3. divided by 4.)	3.85%
6.	Investment Gain/(Loss): [5 - 8.0%] x4	$ (87,429,289)

The investment loss for FY 2012 is taken together with past experience to determine an actuarial asset value for determining the City's contribution obligations.

Ordinance 97-164 set up two funds: The Employer Reserve Fund (ERF) and the Benefit Improvement Fund (BIF), which were credited with unallocated earnings from 1996 through 2005. In 1997 a Minimum Stabilization Fund (MSF) was established within each of the funds, which was increased from 2000–2003. All of these funds expired as of June 30, 2005 with negative balances. These negative balances are being recognized in the actuarial value of assets over a ten-year phase-in period which began with the June 30, 2005 valuation.

The chart below shows the recognition of the remaining investment gains/(losses) along with the continued phase-in of the funds described above.

Table II-3
Development of Unallocated Earnings

The development of current unallocated excess/(deficit) earnings over the most recent two years is as follows.

	Valuation Date 6/30/2011	Valuation Date 6/30/2012
1. Remaining net excess earnings from prior valuation	$ (429,561,850)	$ (198,638,769)
2. New investment Gain/(Loss)	217,331,959	(87,429,289)
3. Current net excess earnings (1. + 2.)	$ (212,229,891)	$ (286,068,058)
4. Allocation for 10% of BIF, ERF &MSF	(36,068,570)	(36,068,570)
5. One-fifth (credit) charge [3. + 4.]	49,659,692	64,427,326
6. Net unallocated excess/(deficit) earnings [3. + 4. +5.]	$ (198,638,769)	$ (257,709,302)

SECTION II
ASSETS

The chart below shows the calculation of the actuarial value of assets. The assets are smoothed using the unallocated earnings calculation. One additional item is included in the actuarial value of assets, which is the Normal Cost Reserve from Plan Changes.

Table II-4
Actuarial Value of Assets

The actuarial value of assets used to calculate the unfunded actuarial liability is developed as follows.

1.	Assets in the Fund on 6/30/2012	$	2,146,028,004
2.	Remaining BIF, ERF & MSF balance	$	(72,137,140)
3.	Net deferred recognition of unallocated excess/(deficit) earnings	$	(257,709,302)
4.	Normal Cost Reserve from Ordinance 98-319	$	0 *
5.	Present value of prior year's contributions not yet paid	$	0 *
6.	Actuarial value of assets on 6/30/2012 (1. – 2. – 3. + 4. + 5.)	$	2,475,874,446 **

* This reserve is no longer an adjustment to the assets.

** The Actuarial value of assets represents 115.4 of the market value which is down from the same measurement least year of 118.8%.

On an actuarial asset value, the results are below expectation with an investment return for the year of 0.34% which is compared to the valuation interest rate of 7.75%. This is due to the continued gradual recognition of the 2008/2009 investment losses and the phase-in of the negative BIF/ERF/MSF balances.

The chart below shows the schedule of recognition of the phase-in of the BIF/ERF/MSF funds. There are three years remaining in this recognition.

Table II-5
Benefit Improvement Fund, Employer Reserve and Minimum Stabilization Fund

June 30,	Expected Charge	Excess Contribution	Fund Reserve
2005	$ 0	$ 0	$ 412,805,569
2006	82,561,114	0	330,244,455
2007	40,592,404	5,505,220	284,146,831
2008	39,773,570	5,731,841	238,641,420
2009	39,773,570	0	198,867,850
2010	37,493,570	11,400,000	149,974,280
2011	36,068,570	5,700,000	108,205,710
2012	36,068,570	0	72,137,140
2013	36,068,570	0	36,068,570
2014	36,068,570	0	0

SECTION III
LIABILITIES AND EXPERIENCE GAINS/(LOSSES)

The table below presents the actuarial liabilities by membership status and employer, then allocates the assets in proportion to each employer's liabilities, to produce the unfunded actuarial liability by employer. On the following page, this unfunded liability is amortized over 20 years, and that amount is then added to the Net Normal Cost (cost to cover the upcoming year's expected accruals less member contributions) to produce the recommended employer contributions. The System's funded status using market value of assets is also shown for informational purposes.

Table III-1
Liability By Employee Group

		As of June 30, 2012	
	Airport	**City**	**Total**
Number of Participants			
Active	8	4,616	4,624
Service Retired	57	3,590	3,647
Disabled	8	1,002	1,010
Beneficiaries	10	1,469	1,479
Total Participants	83	10,677	10,760
Annual Compensation of Active Participants	$ 594,651	$ 284,006,822	$ 284,601,473
Projected compensation PY 2012	$ 616,950	$ 294,657,078	$ 295,274,028
Average Age	54.48	39.20	39.23
Average Service	26.12	12.71	12.73
Development of Unfunded Actuarial Liability			
Actuarial Liability			
Active	$ 5,080,527	$ 1,048,984,213	$ 1,054,064,740
Service Retired	24,416,062	1,542,606,113	1,567,022,175
Disabled	2,263,688	328,370,713	330,634,401
Beneficiaries	1,215,582	233,859,690	235,075,272
Terminated Vesteds	0	1,865,471	1,865,471
Total Liabilities	$ 32,975,859	$ 3,155,686,200	$ 3,188,662,059
Actuarial Value of Assets (AVA)	$ 25,604,497	$ 2,450,269,949	$ 2,475,874,446
Unfunded Actuarial Liability*	$ 7,371,362	$ 705,416,251	$ 712,787,613
Funded Status using AVA	77.6%	77.6%	77.6%
Market Value of Assets (MVA)**	$ 22,193,358	$ 2,123,834,646	$ 2,146,028,004
Unfunded Liability at Market	$ 10,782,501	$ 1,031,851,553	$ 1,042,634,055
Funded Status using MVA	67.3%	67.3%	67.3%

* Unfunded actuarial liability was allocated in proportion to each employee group's actuarial liability.
** Market Value of Assets was allocated according to the allocation of Actuarial Value of Assets.

SECTION III
LIABILITIES AND EXPERIENCE GAINS/(LOSSES)

The table below presents the change in actuarial liabilities and assets during the plan year. In general, the unfunded actuarial liability (UAL) of any retirement system is expected to change at each subsequent valuation for a variety of reasons. In each valuation, we report on those elements of change in the UAL which are of particular significance, potentially affecting the long-term financial outlook of the System. Below we present key changes in liabilities and assets since the last valuation.

Table III-2
Development of 2012 Experience Gain/(Loss)

		Actuarial Liability	**Actuarial Value of Assets**	**Unfunded Actuarial Liability**
1.	Value as of June 30, 2011	$ 3,104,805,314	$ 2,546,236,459	$ 558,568,855
2.	Additions			
	a. Normal Cost with Expense	$ 67,720,906		$ 67,720,906
	b. Expected Employer Contributions		$ 99,686,139	$ (99,686,139)
	c. Expected Member Contributions		$ 22,866,939	$ (22,866,939)
3.	Decreases			
	a. Benefits	$ (205,593,731)	$ (205,593,731)	$ 0
	b. Actual Expenses	$ (3,672,958)	$ (3,672,958)	$ 0
4.	Expected Interest			
	a. On 1 for one year	$ 248,384,425	$ 203,698,917	$ 44,685,508
	b. On 2a for one year	$ 5,417,672	$ 0	$ 5,417,672
	c. On 2b for one year*	$ 0	$ 7,974,891	$ (7,974,891)
	d. On 2c for ½ year	$ 0	$ 914,678	$ (914,678)
	e. On 3a for ½ year	$ (8,223,749)	$ (8,223,749)	$ 0
	f. On 3b for ½ year	$ (146,918)	$ (146,918)	$ 0
5.	Expected Value June 30, 2012: (sum 1. - 4.)	$ 3,208,690,961	$ 2,663,740,667	$ 544,950,294
6.	Excess Contributions	$ 0	$ 7,802,264	$ (7,802,264)
7.	Due to Change in Actuarial Systems	$ 29,578,963	$ 0	$ 29,578,963
8	Assumption Change Gain/(Loss)	$ (33,765,592)	$ 0	$ (33,765,592)
9.	Expected Value After Changes:	$ 3,212,877,589	$ 2,671,542,931	$ 541,334,658
10.	Actual Value as of June 30, 2012	$ 3,188,662,059	$ 2,475,874,446	$ 713,787,613
11.	Actuarial Gain/(Loss):	$ 24,215,530	$ (195,668,484)	$ (171,452,954)
12.	Total Gain/(Loss):	$ 20,028,902	$ (195,668,484)	$ (175,639,583)

* Assumes employer contributions made at beginning of year.

SECTION III
LIABILITIES AND EXPERIENCE GAINS/(LOSSES)

The table below provides the components of the liability gain developed in the previous table.

Table III-3
Elements of Actuarial Liability – Gain/(Loss)

1.	Age and Service Retirements – Gain/(Loss)	$ 6,148,523
2.	Disability Retirements – Gain/(Loss)	(11,211,796)
3.	Death in Service Benefits – Gain/(Loss)	206,491
4.	Withdrawal from Employment – Gain/(Loss)	(2,123,530)
5.	Pay Increases – Gain/(Loss)	11,705,669
6.	Death After Retirement – Gain/(Loss)	697,503
7.	New Entrants – Gain/(Loss)	(1,806,726)
8.	Other – Gain/(Loss) *	16,412,768
9.	Total Actuarial Liability – Gain/(Loss) (sum 1. to 8.)	$ 20,028,902

* Includes the addition of terminated vested liability, gain/on administrative expenses and data corrections.

SECTION IV
CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine the level of contributions needed to achieve and maintain an appropriate funded status. Typically, the primary goal in setting contributions is to maintain, over time, a pattern of contributions that is both stable and predictable.

For this System, the funding methodology employed is the Projected Unit Credit Actuarial Cost Method. Under this method, there are three components to the total contribution: the normal cost, a provision for anticipated expenses and an amortization of the unfunded actuarial liability (UAL). The total normal cost is determined for each active participant in accordance with the method described in the appendices. We then subtract the anticipated member contributions for the year to arrive at the employer normal cost. Expenses designed to approximate the administrative expenses for the coming year are then added to this number.

The UAL amount is developed in Section III of this report. In this section, we develop the contribution amounts by amortizing the UAL over a 20-year period, using a level dollar amortization approach.

The table below develops the Airport and City contributions to be paid in Fiscal Year 2013.

Table IV-1
Contribution Summary

	As of June 30, 2012			
	Airport	**City**	**Total**	**% of Payroll**
Total Normal Cost	$ 114,976	$ 63,571,853	$ 63,686,829	22.38%
Expense Load	8,920	4,260,102	4,269,022	1.50%
Expected Employee Contributions for FY 2014	(59,465)	(28,400,682)	(28,460,147)	-10.00%
Net Normal Cost	$ 64,431	$ 39,431,273	$ 39,495,704	13.88%
20-Year Amortization of Unfunded Actuarial Liability	$ 683,876	$ 65,444,776	$ 66,128,652	23.24%
Net Plan Cost at 7/1/2012	$ 748,307	$ 104,876,049	$ 105,624,356	37.11%
Interest to 7/1/2013	57,994	8,127,894	8,185,888	2.88%
Net Plan Cost at 7/1/2013	$ 806,301	$ 113,003,943	$ 113,810,244	39.99%

APPENDIX A
PLAN MEMBERSHIP

The data for this valuation was provided electronically in Excel and text formats by the Retirement System Office. Cheiron did not audit any of the data. The data for active and inactive participants is as of June 30, 2012.

The following pages contain a summary of the data provided.

- Reconciliation of active members as of June 30, 2012
- Reconciliation of retirees and beneficiaries as of June 30, 2012
- Age/service and age/salary/service distribution for active members as of June 30, 2012
- Counts and average benefit amount by age for retirees, beneficiaries and disabled members as of June 30, 2012

APPENDIX A
PLAN MEMBERSHIP

Reconciliation of Active F&P Members				
A.	**Active Members as of June 30, 2011**			**4,575**
B.	Exits:			
	1.	Terminations:	Non-vested	77
	2.	Transfers	Out	0
	3.	Leaves:	Other	0
	4.	Prior Incorrect Inclusions		0
	5.	Deaths:	Line-of-Duty	0
			Non-Line-of-Duty w/ Survivor	3
			Non-Line-of-Duty w/out Survivor	4
	6.	Retirements:	Service	102
	7.	Disablements:	Line-of-Duty	31
			Line-of-Duty - 100%	0
			Non-Line-of-Duty	9
	8.	Other Exits:	Hired & Terminated During Year	9
	9.	Subtotal (all exits):		235
	10.	Military Leaves:		15
	11.	Pending Disablement:		22
C.	**Remaining Active (A. - B.9)**			**4,340**
D.	Entrances:			
	1.	New Entrants		277
	2.	Prior Omissions		5
	3.	Transfers In		0
	4.	Restorations:	Pending	0
			Leave	0
			Retirement	0
			Disability - Non-Line-of-Duty	0
			Disability - Line-of-Duty	0
			Other Termination	2
	5.	Subtotal (all entrances):		284
E.	**Active Members as of June 30, 2012 (C. + D.5)**			**4,624**

APPENDIX A
PLAN MEMBERSHIP

Reconciliation of Inactive F&P Members

	Retired		Disabled		
	Primary	**Beneficiary**	**Primary**	**Beneficiary**	**Total**
A. Members as of June 30, 2011	**3,632**	**1,029**	**1,004**	**435**	**6,100**
B. Exits:					
1. Payments Ceased	0	4	0	5	9
2. Returned to Active Membership	1	0	0	0	1
3. Prior Incorrect Inclusion	0	0	0	0	0
4. Deaths: Primary with no Survivor	34	0	15	0	49
Beneficiary	0	50	0	18	68
Primary with Survivor	53	0	18	0	71
5. Subtotal (all exits):	88	54	33	23	198
C. Remaining Members (A - B.5)	3,544	975	971	412	5,902
Adjustments	1	0	(1)	0	0
Adjusted Remaining Members	3,545	975	970	412	5,902
D. Entrances:					
1. New Retirements: Primary	102	0	40	0	142
2. Active Death: Beneficiary	0	4	0	0	4
3. Beneficiary Assumes Payments	0	53	0	18	71
4. Prior Omissions	0	0	0	0	0
5. Ex-Spouse Receiving Payments	0	14	0	3	17
6. Subtotal (all exits):	102	71	40	21	234
E. Members as of June 30, 2012 (C + D.6)	**3,647**	**1,046**	**1,010**	**433**	**6,136**

APPENDIX A
PLAN MEMBERSHIP

AGE/SERVICE DISTRIBUTION OF ACTIVE PARTICIPANTS

ACTIVE PARTICIPANTS AS OF JUNE 30, 2012

	COMPLETED YEARS OF CREDITED SERVICE									
AGE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	Total
Under 25	208	16	0	0	0	0	0	0	0	224
25-29	490	212	2	0	0	0	0	0	0	704
30-34	141	318	147	4	0	0	0	0	0	610
35-39	64	220	293	139	5	0	0	0	0	721
40-44	54	141	205	438	187	7	0	0	0	1,032
45-49	19	57	79	190	193	129	2	0	0	669
50-54	7	13	29	54	75	122	67	2	0	369
55-59	4	4	14	20	37	39	69	24	0	211
60-64	0	1	1	6	7	15	13	20	5	68
65-69	0	0	0	1	0	1	0	3	7	12
70 & Up	0	0	0	1	0	0	0	1	2	4
Total	987	982	770	853	504	313	151	50	14	**4,624**

Average Age = 39.23 Average Service = 12.73

APPENDIX A
PLAN MEMBERSHIP

AGE/SERVICE DISTRIBUTION OF ACTIVE PARTICIPANTS

ACTIVE PARTICIPANTS AS OF JUNE 30, 2012

					AVERAGE EARNINGS					
AGE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	Total
Under 25	$ 42,441	$ 53,267	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 43,214
25-29	45,455	56,865	61,890	0	0	0	0	0	0	48,938
30-34	46,796	58,601	62,671	67,304	0	0	0	0	0	56,910
35-39	48,253	59,253	63,614	68,712	75,362	0	0	0	0	61,984
40-44	47,751	59,273	63,659	69,724	73,049	75,994	0	0	0	66,587
45-49	48,899	59,821	62,510	67,260	70,635	75,619	69,893	0	0	68,137
50-54	67,727	60,234	63,443	65,193	68,967	71,699	80,157	81,033	0	70,650
55-59	52,546	59,253	61,317	64,057	66,138	70,610	74,474	78,436	0	70,184
60-64	0	62,324	62,905	66,765	66,469	69,995	71,439	72,790	75,025	70,598
65-69	0	0	0	64,652	0	81,416	0	86,551	74,012	76,984
70 & Up	0	0	0	66,809	0	0	0	11,592	40,743	39,972
Total	$ 45,572	$ 58,481	$ 63,279	$ 68,549	$ 70,941	$ 73,224	$ 76,674	$ 75,432	$ 69,621	$ 61,549

Total Earnings = $ 284,601,473 Average Earnings = $ 61,549

APPENDIX A
PLAN MEMBERSHIP

Schedule of Benefit Recipients by Attained Age and Type of Retirement
June 30, 2012 - Primary Members

	TYPE OF RETIREMENT					
AGE	NR	DS	NLOD Dis	LOD Dis	LOD 100	Total
Under 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	10	0	10
30-34	0	0	3	20	0	23
35-39	1	0	12	56	0	69
40-44	51	1	20	62	0	134
45-49	227	8	27	109	1	372
50-54	346	2	20	65	1	434
55-59	481	1	21	59	0	562
60-64	706	1	20	61	0	788
65-69	662	0	32	70	0	764
70-74	439	0	29	66	2	536
75-79	326	0	31	58	0	415
80-84	239	0	34	61	1	335
85-89	118	0	22	24	0	164
90 & Up	38	0	5	8	0	51
Total	3,634	13	276	729	5	**4,657**
Average Annual Benefit	$ 37,745	$ 31,186	$ 18,576	$ 33,606	$ 60,472	$ 35,967

NR – Normal Retirement for Age and Service
DS - Discontinued Service
NLOD Dis – Non-Line-of-Duty Disability
LOD Dis – Line-of-Duty Disability
LOD 100 – Line-of-Duty Disability 100% of Compensation

APPENDIX A
PLAN MEMBERSHIP

Schedule of Benefit Recipients by Attained Age and Type of Retirement
June 30, 2012 - Beneficiaries

				TYPE OF RETIREMENT					
AGE	NR	DS	NLOD Dis	LOD Dis	LOD 100	NLOD DR	NLOD Dth	LOD Dth	Total
Under 20	2	0	2	1	0	0	5	7	17
20-24	0	0	0	1	0	0	0	1	2
25-29	0	0	0	1	0	0	1	0	2
30-34	0	0	0	1	0	0	0	1	2
35-39	1	0	0	0	0	0	2	0	3
40-44	5	0	1	1	0	0	1	6	14
45-49	22	0	5	4	0	1	2	3	37
50-54	52	0	2	4	0	7	3	2	70
55-59	61	0	8	10	0	6	5	6	96
60-64	87	1	10	11	0	17	10	9	145
65-69	89	0	14	21	0	8	10	9	151
70-74	111	0	26	41	0	10	8	5	201
75-79	120	0	48	49	0	15	7	4	243
80-84	111	0	39	68	0	17	2	8	245
85-89	118	0	19	22	0	7	1	7	174
90 & Up	42	0	9	16	0	5	1	4	77
Total	821	1	183	251	0	93	58	72	**1,479**
Average Annual Benefit	$ 17,279	$ 12,091	$ 14,099	$ 16,661	$ 0	$ 26,361	$ 14,812	$ 40,791	$ 18,396

NR – Normal Retirement for Age and Service
DS - Discontinued Service
NLOD Dis – Non-Line-of-Duty Disability
LOD Dis – Line-of-Duty Disability
LOD 100 – Line-of-Duty 100% of Compensation
NLOD DR – Non-Line-of-Duty Death Member Eligible for Service Retirement
NLOD Dth – Non-Line-of-Duty Death with 25% of Compensation
LOD Dth – Line-of-Duty Death

APPENDIX B
SUMMARY OF PLAN PROVISIONS

1. **Effective Date:**

   The System was effective July 1, 1962 and has periodically been amended. This valuation incorporates the provisions of Ordinance 11-444 (Council Bill 10-0603).

2. **Eligibility:**

   Any officer or employee of the Police Department or the Fire Department and certain Department of Aviation employees shall become a member as a condition of employment. Any officer or employee for whom the City makes contributions to Social Security shall be excluded.

3. **Grandfathering:**

   Effective July 1, 2010, participants who have either met retirement eligibility (see item 7.A.i.) or have attained 15 years of service prior to July 1, 2010 are considered "Grandfathered" for retirement as well as DROP2 eligibility. All other members are "Non-Grandfathered." Members have until December 31, 2010 to purchase service to satisfy the 15-year "Grandfathering" requirement.

4. **Member Contributions:**

   Members contribute at the rate of 6% of regular compensation for their entire period of service. Effective July 1, 2010, members contribute at the rate of 7% of regular compensation. This percentage increased to 8% starting July 1, 2011, 9% starting July 1, 2012 and 10% starting July 1, 2013. Contributions are treated as made by the employer and are made to the System pre-tax according to Section 414(h)(2) of the Internal Revenue Code. Members of the ERS who transferred to this system after July 1, 1967 and did not make up the contributions which would have been made from July 1, 1962 are to have their retirement allowance reduced by the actuarial equivalent of the deficient contributions with interest. Effective July 1, 2010, interest is credited on contributions at a rate of 3.0% per annum. Previously, interest was credited at 5.5% per annum. Members' contributions were reduced in several years by a specific ordinance for each year. For purposes of calculating benefits that depend on the amount of member contributions (e.g., DROP accounts), members are deemed to have contributed the full amount.

5. **Compensation:**

   Earnable compensation is all usual including lodging, subsistence, etc. When compensation is not paid in money, the Board of Trustees shall fix the value of that part of compensation. This definition excludes overtime.

APPENDIX B
SUMMARY OF PLAN PROVISIONS

For grandfathered participants, Average Final Compensation is the average annual compensation during any 18 consecutive month period of service during which earnable compensation was highest or, if less than 18 months, the average during total service.

For non-grandfathered participants, Average Final Compensation is the average annual compensation during any 36 consecutive month period of service during which earnable compensation was highest or, if less than 36 months, the average during total service.

6. **Military Service Credit:**

   A. Military Service Prior to Employment: A maximum of three years of service credit is granted provided the member has acquired 10 years of service and attained age 50, or has acquired 20 years of service regardless of age.

   B. Military Service within Employment: Upon retirement or death, any member who, because of military duty, had a break in employment shall receive credit for the period of absence as provided by the Veterans Reemployment Rights Act.

7. **Retirement Allowance Eligibility:**

   A. Service Retirement
      1) Grandfathered:
         a. Membership commencing prior to July 1, 2003: Age 50 or 20 years of service.
         b. Membership commencing on or after July 1, 2003: Age 50 with 10 years of service as a contributing member, or 20 years of service with 10 years of service as a contributing member.
      2) Non-grandfathered. Earlier of:
         a. Age 55 with 15 years of service, or
         b. 25 years of service, regardless of age, with 15 years of service as a contributing member.

   B. Early Retirement (only non-grandfathered participants):
      1) Membership commencing prior to July 1, 2003: Age 50 or 20 years of service.
      2) Membership commencing on or after July 1, 2003: Age 50 with 10 years of service as a contributing member, or 20 years of service with 10 years of service as a contributing member.
      3) The normal retirement benefit is reduced by 6.5% per year for the first five years, 4.5% per year for the next five years, 3.0% for the next five years and 2% per year thereafter from the date the member would have been eligible for normal retirement assuming continued service.

   C. Non-Line-of-Duty Disability Retirement: Five years of service and certified by a member of the Panel of Hearing Examiners to be mentally or physically incapacitated for the performance of duty and that incapacity is likely to be permanent.

APPENDIX B
SUMMARY OF PLAN PROVISIONS

D. Line-of-Duty Disability Retirement: No service or age constraints apply. The benefit is awarded when a participant becomes totally and permanently incapacitated for duty as the result of an injury while in performance of duty and certified by a Hearing Examiner as incapacitated for the performance of duty where such incapacity is likely to be permanent. Should such disability further result in extensive brain damage causing total incapacity or in the loss of use of both hands or both arms or both feet or both legs or both eyes or any two thereof, an additional pension will be payable.

8. Termination of Employment:

A. Eligible for a Termination Retirement Allowance payable immediately upon completion of 15 years of service if removed from a position without fault. Presently, this benefit is not reflected in the valuation.

B. Eligible for a refund of accumulated contributions if not eligible for any other benefits.

9. Retirement Allowances:

A. Service Retirement: The retirement allowance shall be the sum of:

1) An annuity equal to the actuarial equivalent of a member's accumulated contributions.

2) A pension, which together with the annuity in (1), equals 2.5% of Average Final Compensation times the first 20 years of service, plus 2.0% of Average Final Compensation times service in excess of 20 years.

DROP Benefits

Members with more than 20 years of service on or before December 31, 2009 can elect to participate in DROP at any time. A member's DROP participation period can be for one, two or three years. During that time the member will accrue no additional service. A member who continues employment at the end of his/her DROP participation period shall begin to earn additional service credit.

If a member retires during his/her DROP participation period or immediately at the end of this period, he/she shall be entitled to a Basic DROP Retirement Benefit. This shall equal:

1) The retirement benefit that would have been paid had the member retired at the time he/she began his/her DROP participation, plus

2) A lump sum equal to the member's DROP account. This equals the accumulation of the annuity payments the member would have received had he/she retired at the time his/her DROP participation began receiving benefits, plus the member contributions paid during his/her DROP participation period, plus interest at 8.25%.

If a member retires later than the end of the three-year DROP period but less than 18 months after the conclusion of his/her DROP participation period, he/she is entitled to an Intermediate DROP Retirement Benefit. This shall equal:

1) The retirement benefit that would have been paid had the member retired at the time he/she began his/her DROP participation, plus

2) Benefit accrual of 2% plus an extra 1.5% per year (not to exceed 18 months) for service after the DROP participation period.

3) A lump sum equal to the DROP account. No additions (other than interest) are added after the conclusion of the DROP participation period.

If a member retires more than 18 months after the conclusion of his/her DROP participation period, he/she is entitled to a Full DROP Retirement Benefit. This shall equal:

1) The retirement benefit based on current average final compensation and all service excluding service while a participant is in DROP.

2) Benefit accrual includes an extra 1.5% per year (not to exceed four years) for service after the DROP participation period.

3) A lump sum equal to the DROP account. No additions (other than interest) are added after the conclusion of the DROP participation period.

DROP2 Benefits

Members with more than 20 years of service on or after January 1, 2010, but not before December 31, 2009, can elect to participate in DROP2. Effective July 1, 2010, the 20-year requirement was moved to 25 years for non-grandfathered members. A member's DROP2 participation period can be for one, two or three years. The participant must remain in DROP2 for at least one year. Those participants who retire prior to the end of the first year are not entitled to receive any amounts accumulated in the DROP2 account. No additional service is accrued during DROP2 participation. A member who continues employment at the end of the DROP2 participation period shall begin to earn additional service credit.

APPENDIX B
SUMMARY OF PLAN PROVISIONS

If a member retires during the DROP2 participation period or immediately at the end of this period, the member is entitled to an Early DROP2 Retirement Benefit. This is equal to:

1) The retirement benefit that would have been paid had the member retired at the time he/she began his/her DROP2 participation, plus

2) A lump sum equal to the member's DROP2 account. This equals the accumulation of the annuity payments the member would have received had he/she retired at the time his/her DROP2 participation began plus the member contributions paid during his/her DROP2 participation period, plus interest at 5.5% for grandfathered participants and 3.0% for non-grandfathered participants.

If a member retires later than the end of the three-year DROP2 period but less than 3.5 years for police employees or five years for fire employees after the conclusion of his/her DROP2 participation period, he/she is entitled to a Mid DROP2 Retirement Benefit. This is equal to:

1) The retirement benefit that would have been paid had the member retired at the time he/she began his/her DROP2 participation, plus

2) Benefit accrual of 2% for service after the DROP2 participation period began.

3) An additional benefit accrual of 1.5% per year (not to exceed four years) for service after the DROP2 participation period for fire employees only. Police employees do not receive an additional benefit accrual.

4) A lump sum equal to the DROP2 account. No additions (other than interest) are added after the conclusion of the DROP2 participation period.

If a member retires more than 3.5 years for police employees or five years for fire employees after the conclusion of his/her DROP2 participation period, he/she is entitled to a Complete DROP2 Retirement Benefit. This shall equal:

1) The retirement benefit based on current average final compensation and all service excluding service while a participant is in DROP2.
2) Benefit accrual includes an extra 1.5% per year (no to exceed four years) for service after the DROP2 participation period for fire employees only. Police employees do not receive an additional benefit accrual.

3) A lump sum equal to the DROP2 account. No additions (other than interest) are added after the conclusion of the DROP2 participation period.

APPENDIX B
SUMMARY OF PLAN PROVISIONS

B. Non-Line-of Duty Disability Retirement: A member shall receive an annuity equal to the actuarial equivalent of a member's accumulated contributions plus a pension which, together with the annuity, shall equal 2.5% of his/her Average Final Compensation times service up to 20 years, plus 2.0% of his/her Average Final Compensation times service in excess of 20 years, but in no event less than 25% of Average Final Compensation.

NOTE: This allowance is offset by workers' compensation, if the member entered the system after July 1, 1970.

C. Line-of-Duty Disability Retirement: An annuity equal to the actuarial equivalent of a member's accumulated contributions, plus a pension equal to 66-2/3% of Average Final Compensation. An additional pension is paid for certain disabilities so that the retirement allowance is equal to 100% of compensation at the time of retirement.

NOTE: The same offsets apply as in Non-Line-of-Duty Disability.

D. Termination Retirement Allowance: Determined the same as if the member had retired on a Non-Line-of-Duty Disability Allowance.

10. Optional Methods of Receiving Benefit Payments:

These options are available for Service, Non-Line-of-Duty Disability and Line-of-Duty Disability Retirement. The option and/or beneficiary may be changed within 30 days after retirement. For purposes of determining the amount of an optional retirement benefit, a benefit of equivalent value is determined using 5% per annum compounded annually and the UP-84 mortality table set forward one year, except that in the case of disability retirements, the table is set forward seven years.

A. Joint and 50% to un-remarried spouse or dependent children until the last marries, dies or attains age 18 (age 22 if a full-time student) (this is known as the maximum service of allowance).

B. Cash refund to designated beneficiary with refund based on present value of allowance at retirement less payments made.

C. Joint and 100% to Contingent beneficiary.

D. Joint and 50% to Contingent beneficiary.

E. Some other periodic benefit subject to the approval of the Board of Trustees.

APPENDIX B
SUMMARY OF PLAN PROVISIONS

11. Non-Line-of-Duty-Death Benefits:

Upon the non-duty related death of a member in service, benefits are payable as follows:

A. The member's accumulated contributions shall be payable to the member's designated beneficiary or estate.

B. If a member had one or more years of service, 50% of the greater of his/her current annual compensation or Average Final Compensation will be payable as a lump sum.

C. In lieu of A and B above, if the member had at least two years of continuous service, the benefit is an annual sum equal to 25% of the member's regular gross compensation, plus 1.5% of regular gross compensation times years of service in excess of two years, up to a maximum benefit of 50% of regular gross compensation. The death benefit shall be payable to:

   1) the widow(er), if the beneficiary so elects, during widowhood only, or

   2) if no eligible widow(er), the child or children until the last marries, dies or attains age 18 (age 22 if a full-time student).

D. If the member was eligible for a service retirement or, if retired on account of service or non-line-of duty disability and dies within 30 days of retirement, and the member's designated beneficiary is the member's spouse with whom the member had been living for at least one year or the member's surviving parent(s), such beneficiary may elect, in lieu of (A) and (B) above, an allowance equal to the amount that would have been paid under the Joint and 100% Contingent Option.

E. If a member dies during or following the DROP participation period, the beneficiary will receive the non-line-of-duty death benefit according to the DROP provisions. The member's DROP account is payable according to the form of the non-line-of-duty death benefit as follows:

   1) Lump-sum benefit: The beneficiary of a decreased DROP participant will receive the balance of the deceased member's DROP account in a lump sum payment.

   2) 25% plus benefit: The beneficiary can elect to receive the balance of the deceased member's DROP account in a lump sum payment or in periodic payments.

   3) 100% survivorship benefit: The beneficiary can elect to receive the balance of the deceased member's DROP account in a lump sum payment or in periodic payments.

F. If a member dies after a minimum of one year of DROP2 participation or following the DROP2 participation period, the beneficiary will receive the non-line-of-duty death benefit according to the DROP2 provisions. The member's DROP2 account is payable according to the form of the non-line-of-duty death benefit as follows:

1) Lump-sum benefit: The beneficiary of a deceased DROP2 participant will receive the balance of the deceased member's DROP2 account in a lump sum payment.

2) 25% plus benefit: The beneficiary can elect to receive the balance of the deceased member's DROP2 account in a lump sum payment or periodic payments.

3) 100% survivorship benefit: The beneficiary can elect to receive the balance of the deceased member's DROP2 account in a lump sum payment or in periodic payments.

If a member dies within the first year of the DROP2 participation period, the benefit will be calculated as though the member has never participated in DROP2.

These benefits are offset by workers' compensation, if the member entered the system after July 1, 1970. If no beneficiary and if intestate without heirs, then the benefit shall remain part of the System.

12. Line-of-Duty Death Benefits:

If a member's death arose out of and in the performance of duty as certified by a Hearing Examiner, or if the member dies within five years as a result of the last injury which resulted in a Line-of-Duty Disability Retirement, a refund of accumulated contributions shall be paid, plus a pension of 100% of current compensation (not less than $15,000) shall be payable to:

A. the surviving spouse, or

B. if no eligible spouse or if the spouse dies, any children, equally, until age 18 (or age 22 if full-time students(s)), or

C. if no eligible spouse or children, any dependent father or dependent mother for their lifetime.

This benefit is offset by worker's compensation, if the member entered the system after July 1, 1970. If no beneficiary and if intestate without heirs, then the benefit shall remain part of the System.

13. Minimum Benefits:

Effective July 1, 2010 for current and future beneficiaries of "pre-DROP" retirees (members who retired prior to August 1, 1996 with 20 or more years of service), the minimum annual benefit is $16,000. Benefits will increase based on the applicable COLA. However, for future beneficiaries of the current pre-DROP retirees, the $16,000 minimum will not be adjusted while the primary annuitant (retiree) is still alive. Once payments to the beneficiaries commence, benefits will increase with the applicable COLA regardless of whether the minimum applies.

Effective January 1, 2012 for current and future beneficiaries of members who retired on account of line-of-duty disability prior to August 1, 1996 with less than 20 years of service, the minimum annual benefit is $16,000. Benefits will increase based on the applicable COLA.

14. Post-Retirement Benefit Increase:

Post-retirement benefit increases (Cost of Living Adjustments of COLAs) are automatically provided to all current and future retirees and beneficiaries according to the following schedule:

i. Under age 55 – No COLA
ii. Age 55 to age 65 – 1% annual COLA
iii. After age 65 – 2% annual COLA

For current and future members receiving a 100% line-of-duty disability benefit as well as their beneficiaries, the 2% annual COLA will apply regardless of age.

Only retirees and beneficiaries who have been receiving periodic benefit payments for two or more years as of the June 30 determination date are eligible for the increase. For a member who retires during or at the end of the DROP participation period, the member's DROP participation period counts toward the eligibility requirement for post-retirement benefit increases. The 2% COLA is first effective January 1, 2011 and the 1% COLA is first effective January 1, 2012.

Prior to June 30, 2010, investment return based increases were provided to retirees and beneficiaries.

15. Changes Since Last Valuation:

None.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

1. Rate of Investment Return:

7.75% compounded annually (adopted 6/30/12)

2. Rates of Salary Increase:

Salary increases are split into a static inflation assumption of 3.75% and a merit scale based on service, shown below (adopted 6/30/12).

Service	Merit Scale
0	8.00%
1	6.50%
2	5.00%
3	4.50%
4	3.00%
5 – 11	1.50%
12 – 14	1.25%
15 – 20	1.00%
21+	0.50%

3. Plan Expenses:

All expenses are paid from the fund. Administrative expenses are added to the contribution in the amount of 1.5% of covered payroll (adopted 6/30/12).

4. Pre-Retirement Mortality and Disability:

	Non-Line-of-	Line-of-Duty	Non-Line-of-Duty Death[1]		Line-of-
Age	Duty Disability	Disability	Male	Female	Duty Death[2]
20	0.000146	0.001073	0.000285	0.000163	0.000076
25	0.000149	0.001412	0.000340	0.000180	0.000119
30	0.000381	0.002224	0.000422	0.000239	0.000164
35	0.001227	0.004369	0.000735	0.000425	0.000253
40	0.001179	0.006191	0.000996	0.000607	0.000385
45	0.001699	0.007006	0.001323	0.000957	0.000433
50	0.001795	0.005710	0.001783	0.001412	0.000372
55	0.000927	0.005789	0.002991	0.002507	0.000300
60	0.000745	0.007706	0.005742	0.004808	0.000159
64	0.000520	0.007886	0.009797	0.008198	0.000062

[1] RP-2000 Combined Mortality Table projected to 2010 with scale AA.
[2] Benefit loaded ½% for post-disability line-of-duty death benefit.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

5. Post-Retirement Mortality (adopted 6/30/2012):

Retirees and Beneficiaries: RP-2000 Combined Mortality Table projected to 2010 with scale AA.

Disabled members: RP-2000 Combined Mortality Table projected to 2010 with scale AA set forward four years.

Sample rates are shown below.

	Retirees and Beneficiaries		Disabled Members	
Age	Male	Female	Male	Female
55	0.002991	0.002507	0.005059	0.004224
60	0.005742	0.004808	0.009797	0.008198
65	0.011062	0.009231	0.017198	0.014133
70	0.019091	0.015923	0.029145	0.023731
75	0.032859	0.025937	0.051861	0.038690
80	0.058213	0.042767	0.093010	0.064801
85	0.0103244	0.072923	0.0158284	0.115627
90	0.0176202	0.127784	0.0243273	0.179176

Mortality through the 2010 experience study followed the RP 2000 tables, projected to 2005. The tables projected to 2010 should provide an additional ten years of projections but this will be monitored at the next quinquennial experience review.

6. Withdrawal:

Years of Service	Withdrawal[1]
0	7.50%
1	6.25%
2	5.00%
3	4.25%
4	3.75%
5	3.25%
6	2.75%
7	2.35%
8	1.95%
9	1.60%
10	1.30
11	0.85
12 – 19	0.35
20+	0.00

[1] Withdrawal decrements are reduced to zero when participant is eligible to retire.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

7. Service Retirement:

The valuation uses the retirement rates that vary according to whether a member participates in the DROP or DROP2. Members who do not join DROP or DROP2 are assumed to have retirement rates that vary by service until age 50. After age 50 the rates are assumed to vary solely by age.

Members who join DROP or DROP2 are assumed to have retirement rates that vary solely by service from the time they join and leave DROP/DROP2. The assumption about whether a member will elect DROP/DROP2 varies according to the group to which they below as follows:

	Police	**Fire**
DROP	90%	90%
DROP2 Grandfathered	90%	90%
DROP2 Non-Grandfathered	75%	85%

Retirement rates for members are as follows and reflect the possibilities of retirement with and without DROP/DROP2 rates (see Appendix C for the definition of grandfathered DROP2 members).

The following rates apply to non-grandfathered members (participants who have not met the full service retirement eligibility, or have less than 15 years of service as of July 1, 2010).

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

Probabilities of Retirement Rather Than DROP

Those Eligible for DROP or Grandfathered DROP2:

Ages Less Than 50	
Years of Service	**Probability of Retirement**
20	30%
21	20%
22 and up	100%

Ages 50 and Higher	
Age	**Probability of Retirement**
50	6.4%
51	4.6%
52	4.6%
53	4.7%
54	5.9%
55	7.3%
56	6.9%
57	6.9%
58	6.9%
59	13.9%
60	21.2%
61	17.2%
62	25.5%
63	25.5%
64	32.3%
65	100.0%

Assumptions vary between the rate applicable in the first year of eligibility for unreduced retirement and those for subsequent years. Rates also vary by police and fire.

	Police		Fire	
Age	**First Eligible**	**Subsequent**	**First Eligible**	**Subsequent**
Less than 65	70.0%	60.0%	60.0%	50.0%
65 and up	100.0%	100.0%	100.0%	100.0%

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

Probabilities of DROP Rather Than Retirement

Those Eligible for DROP:

Years After Electing Drop	DROP Exit Rates Police	DROP Exit Rates Fire
1	10.0%	4.0%
2	10.0%	5.0%
3	12.0%	8.0%
4	15.0%	10.0%
5	15.0%	10.0%
6	17.0%	10.0%
7	17.0%	18.0%
8	17.0%	18.0%
9	17.0%	10.0%
10	17.0%	15.0%
11	25.0%	20.0%
12	25.0%	20.0%
13	28.0%	20.0%
14	28.0%	25.0%
15 or more	28.0%	25.0%

NOTE: In all cases once the participant reaches age 65, there is 100% probability of leaving DROP to commence benefit receipt.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

Grandfathered Participants in DROP2:

	DROP Exit Rates	
Years After Electing Drop	**Police**	**Fire**
1	10.0%	4.0%
2	10.0%	5.0%
3	16.0%	11.0%
4	16.0%	11.0%
5	16.0%	11.0%
6	10.0%	8.0%
7	17.0%	8.0%
8	17.0%	22.0%
9	17.0%	10.0%
10	17.0%	15.0%
11	25.0%	20.0%
12	25.0%	20.0%
13	28.0%	20.0%
14	28.0%	25.0%
15 or more	28.0%	25.0%

NOTE: In all cases once the participant reaches age 65, there is 100% probability of leaving DROP to commence benefit receipt.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

Non-Grandfathered Participants in DROP2:

Years After Electing Drop	DROP Exit Rates Police	DROP Exit Rates Fire
1	0.0%	0.0%
2	6.0%	4.0%
3	7.0%	5.0%
4	16.0%	14.0%
5	15.0%	13.0%
6	18.0%	15.0%
7	14.0%	12.0%
8	36.0%	12.0%
9	36.0%	34.0%
10	36.0%	34.0%
11	36.5%	33.5%
12	36.5%	33.5%
13	36.5%	33.5%
14	36.5%	33.5%
15 or more	37.0%	33.0%

NOTE: In all cases once the participant reaches age 65, there is 100% probability of leaving DROP to commence benefit receipt.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

Non-Grandfathered DROP2

Non-grandfathered Early Retirement Rates for Firefighters

Age	Service <10	10	11	12	13	14	15	16	17	18	19	20	21-24	25+
<45												3.00%	2.00%	
45												3.00%	3.00%	
46						**Members Not Yet Eligible for Early Retirement**						3.00%	3.00%	
47												3.00%	3.00%	
48												3.00%	3.00%	
49												4.00%	4.00%	
50	3.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	
51	3.00%	6.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	
52	3.00%	6.00%	8.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
53	3.00%	6.00%	8.00%	10.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	
54	3.00%	6.00%	8.00%	10.00%	12.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	
55	4.50%	7.00%	9.50%	12.00%	14.50%	17.00%								
56	5.00%	8.00%	11.00%	14.00%	17.00%	20.00%								
57	5.00%	8.00%	11.00%	15.00%	19.00%	23.00%								
58	5.00%	8.00%	14.00%	18.00%	22.00%	26.00%								
59	5.00%	8.00%	15.00%	20.00%	25.00%	30.00%								
60	5.00%	15.00%	20.00%	25.00%	30.00%	35.00%					**Members Eligible for Unreduced Benefits**			
61	10.00%	20.00%	25.00%	30.00%	35.00%	40.00%								
62	15.00%	20.00%	25.00%	30.00%	35.00%	40.00%								
63	15.00%	20.00%	25.00%	30.00%	35.00%	40.00%								
64	15.00%	20.00%	25.00%	30.00%	35.00%	40.00%								
65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%								

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

Non-grandfathered Early Retirement Rates for Police

Age	Service <10	10	11	12	13	14	15	16	17	18	19	20	21-24	25+
<45												5.00%	4.00%	
45												5.00%	5.00%	
46						Members Not Yet Eligible for Early Retirement						5.00%	5.00%	
47												5.00%	5.00%	
48												5.00%	5.00%	
49												6.00%	6.00%	
50	5.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	
51	5.00%	8.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
52	5.00%	8.00%	10.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	12.00%	
53	5.00%	8.00%	10.00%	12.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	
54	5.00%	8.00%	10.00%	12.00%	14.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%	
55	5.00%	8.00%	11.00%	14.00%	17.00%	20.00%								
56	7.00%	11.00%	15.00%	19.00%	23.00%	27.00%								
57	10.00%	15.00%	20.00%	25.00%	30.00%	35.00%								
58	15.00%	20.00%	25.00%	30.00%	35.00%	40.00%								
59	20.00%	25.00%	30.00%	35.00%	40.00%	45.00%								
60	25.00%	30.00%	35.00%	40.00%	45.00%	50.00%				Members Eligible for Unreduced Benefits				
61	30.00%	35.00%	40.00%	45.00%	50.00%	55.00%								
62	35.00%	40.00%	45.00%	50.00%	55.00%	60.00%								
63	35.00%	40.00%	45.00%	50.00%	55.00%	60.00%								
64	35.00%	40.00%	45.00%	50.00%	55.00%	60.00%								
65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%								

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

Non-Grandfathered Full DROP2 Rates		
	DROP2 Retirement Rate	
Years After Electing DROP2	Fire (with 85% reduction)	Police (with 75% reduction)
0	0.00%	0.00%
1	3.40%	4.50%
2	4.25%	5.25%
3	11.90%	12.00%
4	11.05%	11.25%
5	12.75%	13.50%
6	10.20%	10.50%
7	10.20%	27.00%
8	28.90%	27.00%
9	28.90%	27.00%
10	28.48%	27.38%
11	28.48%	27.38%
12	28.48%	27.38%
13	28.48%	27.38%
14+	28.05%	27.75%

8. Line-of-Duty Disability:

Benefit Types: 1% of line-of-duty disability retirements are assumed to receive a pension equal to 100% of compensation at the time of retirement. The rest are assumed to receive a pension equal to 66 2/3% of Average Final Compensation.

Form of Payment: All future withdrawal benefits are assumed to be paid in the form of a lump sum refund of employee contributions.

All future retirement benefits are assumed to be paid in the form of a 50% Joint and Survivor Annuity. In addition, members participating in DROP are assumed to receive their DROP account balance in the form of a lump sum upon retirement.

Future non-line-of-duty disability retirement benefits for current active members with fewer than five years of service (i.e., eligible only for the refund of employee contributions) are assumed to be paid in the form of a lump sum. All other disability retirement benefits are assumed to be paid in the form of a 50% Joint and Survivor Annuity. In addition, members participating in DROP

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

are assumed to receive their DROP account in the form of a lump sum upon disability retirement.

Future death benefits for current active members who have not reached service retirement eligibility are assumed to be paid in the form of a lump sum. Certain line of duty death benefits for refund of employee contributions are assumed to be paid in the form of a lump sum. All other death benefits are assumed to be paid in the form of a single life annuity equal to the member's accrued benefit. Beneficiaries of members participating in DROP are assumed to additionally receive the member's DROP account in the form of a lump sum.

9. **Cost-of-Living Adjustment Assumption:**

Assumed to follow System provisions – 0%, 1% or 2% depending on age and type of retirement.

10. **Percent Married:** Males 70%, Females 70%.

11. **Spouse Age:** A husband is assumed to be four years older than his wife.

12. **Remarriage Rates:** None

13. **Children:**

All benefits with Joint & Survivor Forms of Payments for retirees had their survivor benefits increased by 2.0% to account for children's benefits.

14. **Benefit Loads:**

Benefits to certain types of future beneficiaries receiving Line-of-Duty death benefits were increased by 7.0% to allow for contingent beneficiaries.

Benefits to certain types of future members receiving Line-of-Duty disability benefits were increased by 1.5% to allow for possible conversion to Line-of-Duty death benefits.

Benefits payable in the form of a Joint and Survivor 100% Pop Up or Joint and Survivor 50% Pop Up were valued, respectively, as 100% Joint and Survivor with a 2.70% load and 50% Joint and Survivor with a 1.50% load to account for the additional value of the Pop Up form of benefit in the absence of data on the amount to which the benefit would increase. (6/30/2012)

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

All future retirement benefits were increased by 1% to account for possible child beneficiaries. (6/30/2012)

15. Funding Policy:

The City's funding policy is to contribute the amount equal to the normal cost, plus the accrued liability contribution or less the amortization of the excess assets, as the case may be. However, the aggregate payment by the City must be sufficient, when combined with the amount in the Fund, to provide the pensions and other benefits payable out of the Fund during the then-current year.

16. Changes Since Last Valuation:

Mortality – Updated mortality for healthy pre- and post-retirement participants to the RP-2000 Combined Mortality Table with mortality improvements projected to 2010. Post-retirement disabled participants were updated to the same mortality table, but with ages set forward by four years.

Withdrawal – Updated to reflect recent plan experience.

Disability (Non-Line-of-Duty & Line-of-Duty) – Updated to reflect recent plan experience.

Retirement – Assumed rates were updated as follows:

Grandfathered DROP – Separate assumptions for firefighters and police, along with updated rates.

Grandfathered non-DROP – Updated rates for those participants under age 50 with 20+ years of service.

Grandfathered DROP2 – Updated rates.

Investment Return – Decreased rate from 8.00% to 7.75%.

Salary Scale – Updated from age-related scale to the sum of a 3.75% static inflation and a merit scale based on service.

Marriage Assumption – Decreased rate from 75% to 70%.

Children – Decreased rate from 4% to 2% to account for children's benefit.

Line-of-Duty Death Benefit Load – Increased from 3% to 7%.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

100% J&S Pop-Up Benefit Load – Decreased from 3% to 2.70%.

Administrative Expenses – Updated from a percentage of the market value of assets to a percentage of the annual payroll.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

1. Method of Funding

The Projected Unit Credit Funding Method has been in use since the effective date of 6/30/1988.

Liabilities and contributions shown in this report are computed using the Projected Unit Credit method of funding.

The objective under this method is to fund each participant's benefits under the Plan as they would accrue, taking into consideration future salary increases. The total pension, to which each participant is expected to become entitled, is broken down into units, each associated with a year of past or future credited service. When this method is introduced, there will be an initial liability for benefits credited for service prior to that date, and to the extent that the liability is not covered by assets of the Plan, there is an unfunded liability to be funded over a chosen period in accordance with an amortization schedule.

A description of the calculation follows:

An individual's **accrued benefit** for valuation purposes related to a particular separation date is the accrued benefit described under the Plan but determined using the projected salary that would be used in the calculation of the benefit on the expected separation date.

The **benefit** deemed to accrue for an individual during a plan year is the prorated portion of the projected benefit attributable to one year of service. The projected benefit is calculated at the various anticipated separation dates.

An individual's **accrued liability** is the present value of the accrued benefit for valuation purposes at the beginning of the plan year, and the normal cost is the present value of the benefit deemed to accrue in the plan year. If multi-decrements are used, the accrued liability and the normal cost for an individual are the sum of the component accrued liabilities and normal costs associated with the various anticipated separation dates. Such accrued liabilities and normal costs reflect the accrued benefits as modified to obtain the benefits payable on those dates and the probability of the individual separating on those dates.

The Plan's **normal cost** is the sum of the individual normal costs, and the Plan's **accrued (actuarial) liability** is the sum of the accrued liabilities for all participants under the Plan.

APPENDIX C
ACTUARIAL ASSUMPTIONS AND METHODS

The current unfunded actuarial liability is amortized as a level dollar figure over 20 years. This 20-year period is restarted each year. (Effective 7/1/1992)

Because the Unfunded Actuarial Liability (UAL) is being amortized by an open or rolling amortization period (with re-amortization of the UAL in each valuation), the amortization amounts will never fully eliminate the UAL.

2. Asset Valuation

The actuarial value of assets is equal to the market value, adjusted for investment surpluses and deficits over a five-year period. This calculation is done in the following steps:

1. The investment gain or loss for the current year is calculated; this equals the actual investment earnings during the year minus the expected earnings. (Through the original June 30, 2009 valuation, expected earnings were calculated using a weighted average of the pre- and post-retirement interest rate assumptions multiplied by the mean market value of assets during the year.) Effective July 1, 2010, expected earnings are calculated using the interest rate assumption multiplied by the mean market value of assets during the year.

2. Through the original June 30, 2009 valuation, the amount allocated to the Variable Benefit Fund was deducted from this total.

3. Of this difference, 20% is used in the current actuarial value of assets. Beginning again at June 30, 2007 the remaining 80% is held in reserve.

The actuarial value of assets is the market value less cumulative unallocated earnings plus the remaining balance of the BIF, ERF, and MSF.

Previous valuations also included an adjustment for the employer contribution receivable for the upcoming fiscal year (as determined in the prior year's valuation) and a reserve for anticipated costs under Ordinance 98-319. Neither of these adjustments was made in this valuation, nor will be made in the future.