

**Actuarial Valuation Report
for the
Employees' Retirement System
of the City of Baltimore**

as of June 30, 2011

Produced by **Cheiron**

December 2011

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December 14, 2011

Board of Trustees
Employees' Retirement System
7 East Redwood Street
12th Floor
Baltimore, Maryland 21202-3470

Dear Members of the Board:

We are pleased to submit the June 30, 2011 actuarial valuation of the 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 Plan, and the assumptions as a whole represent our best estimate in cooperation with the Board's views for the future experience of the Plan. The results of this report are only applicable to the System's contribution for Fiscal Year Ending 2013, 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.

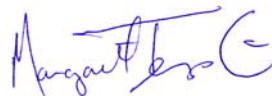
We hereby certify that, to the best of our knowledge, this report and its contents, which are work products of Cheiron, Inc., are complete and accurate and have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of 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 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



Kenneth Kent, FSA, FCA, MAAA
Principal Consulting Actuary



Margaret Tempkin, FSA, MAAA
Principal Consulting Actuary



FOREWORD

Cheiron is pleased to provide the annual actuarial valuation report of the **Employees' Retirement System of the City of Baltimore** as of June 30, 2011. 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,
- 3) **determine** the recommended contributions for FYE 2013,
- 4) **define** the variable benefit increase to be applied on January 1, 2012, and
- 5) **provide specific information** and documentation to support the City's funding obligation and information required by the auditors of the System.

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.

Section V shows the development of the variable benefit calculation.

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.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011

SECTION I
SUMMARY

The key results of the June 30, 2011 actuarial valuation are as follows:

- 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 Board also adopted changes to the funding policy of the Plan as well which will not have material impact on the costs determined for this report but will impact future valuation reports in an effort to ensure full funding of the benefits is achieved in the future. The assumption and method changes reflected in the results of our valuation are highlighted in Appendix B.
- Investments earned 19.59% on a market value basis. The expected rate of return is defined by the definition of *regular interest* in the City Code which is 6.8% for participant liability in pay status and 8.0% for all other liabilities. For comparing the actual return we determined a liability weighted expected return (taking the regular interest times a ratio of the respective present value of benefits over the total present value of benefits of the System) which aggregates these two values resulting in an expected return this year of 7.37%.
- The net investment return during FYE 2011 was above the 6.8% required for an additional variable cost-of-living increase in retiree benefits based on investment earnings. The variable portion of the cost-of-living increase is limited by the Consumer Price Index for the year ending June 30, 2011, and that value equals 3.56%, the amount of the variable benefit increase is developed in the report.
- The actuarial asset value return was 4.32%, which produced a net loss of \$37.8 million to the Fund this year when measured against the expected return of 7.37%.
- The unfunded actuarial liability increased from \$439.7 million on June 30, 2010 to \$530.2 million on June 30, 2011, due to the investment loss of \$37.8 million, liability gain of \$13.3 million, and a change in assumptions to reflect the most recent experience study presented October 31, 2011. The assumption change increased the liabilities by \$72.1 million. Gains and losses are presented in detail in Section III.
- The total recommended contribution increased by 13.2% from \$77,995,005 for FYE 2012 to \$88,300,214 for FYE 2013 as a reflection of the prior year's experience and increased unfunded actuarial liability (UAL) as of June 30, 2011. The experience study changes increased the recommended contributions by \$9,169,802 This represents a projected increase in cost as a percent of pay from 19.43% to 22.47%. The City's portion net of Detention Services and Department of Education of the FYE 2013 is \$ 75,965,579 compared to \$66,896,066 for FYE 2012. The School Board will contribute for Department of Education participants, and the State will contribute for Detention Services participants.
- The newly adopted funding policy of the Board provides for the unfunded actuarial liability to be amortized over a fixed period of 20 years targeting 100% funding by the fiscal year ending 2032. The funding policy does not impact the current year's valuation results.

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION I
SUMMARY**

The tables below provide details on the development of the FYE 2013 contribution results, unfunded actuarial liabilities, and statistics on Plan membership.

Table I-1 Valuation Summary				
	2010 Valuation		2011 Valuation	
	<u>Applies to FYE 2012</u>		<u>Applies to FYE 2013</u>	
	Amount	% of Pay	Amount	% of Pay
1. Contributions				
Total Normal Cost	\$ 33,379,561	8.32%	\$ 35,486,309	9.03%
Expected Employee Contributions	<u>18,154</u>	<u>0.00%</u>	<u>13,405</u>	<u>0.00%</u>
Normal Cost	\$ 33,361,407	8.31%	\$ 35,472,904	9.03%
Allocation from 6/30/2000 excess earnings to pay Ordinance 01-189 normal cost	(2,611,776)	-0.65%	(2,716,247)	-0.69%
Amortization of unfunded actuarial liability	41,467,966	10.33%	49,192,497	12.52%
Interest to beginning of next FY	5,777,408	1.44%	6,351,060	1.62%
Total lump sum cost	\$ 77,995,005	19.43%	\$ 88,300,214	22.47%
2. UNFUNDED LIABILITIES				
Actuarially Liability				
Active	\$ 679,595,438		\$ 727,431,374	
Retirees and dependents	1,103,746,648		1,169,599,360	
Terminated vested	<u>46,882,433</u>		<u>43,416,490</u>	
Total	\$ 1,830,224,519		\$ 1,940,447,224	
Less: Actuarial value of assets	\$ 1,390,514,840		\$ 1,410,211,059	
Unfunded actuarial liability	\$ 439,709,679		\$ 530,236,165	

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION I
SUMMARY**

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

Table I-2 Active Membership Summary						
	Active Members			Payroll		
	2010	2011	% Increase	2010	2011	% Increase
Class A	42	36	-14.29%	\$ 1,715,825	\$ 1,412,939	-17.65%
Class C	<u>9,638</u>	<u>9,357</u>	<u>-2.92%</u>	<u>399,613,155</u>	<u>391,528,196</u>	<u>-2.02%</u>
Total	9,680	9,393	-2.96%	\$ 401,328,980	\$ 392,941,135	-2.09%
Average				\$ 41,460	\$ 41,833	0.90%

Table I-3 Inactive Membership Summary						
	Number of Retirees			Average Annual Benefit Amount		
	2010	2011	% Increase	2010	2011	% Increase
Normal Service Retirement	5,455	5,470	0.3%	\$ 13,794	\$ 14,329	3.9%
Discontinued Service	951	955	0.4%	17,583	18,393	4.6%
Ordinary Disability	801	814	1.6%	8,200	8,315	1.4%
Accidental Disability	78	72	-7.7%	18,578	19,086	2.7%
Social Security Equalization	12	10	-16.7%	5,921	4,933	-16.7%
Beneficiaries of Above	1,215	1,244	2.4%	6,757	7,043	4.2%
Ordinary Death	105	108	2.9%	10,066	10,467	4.0%
Special Death	<u>20</u>	<u>20</u>	<u>0.0%</u>	<u>20,673</u>	<u>21,087</u>	<u>2.0%</u>
Total	8,637	8,693	0.6%	\$ 12,705	\$ 13,166	3.6%

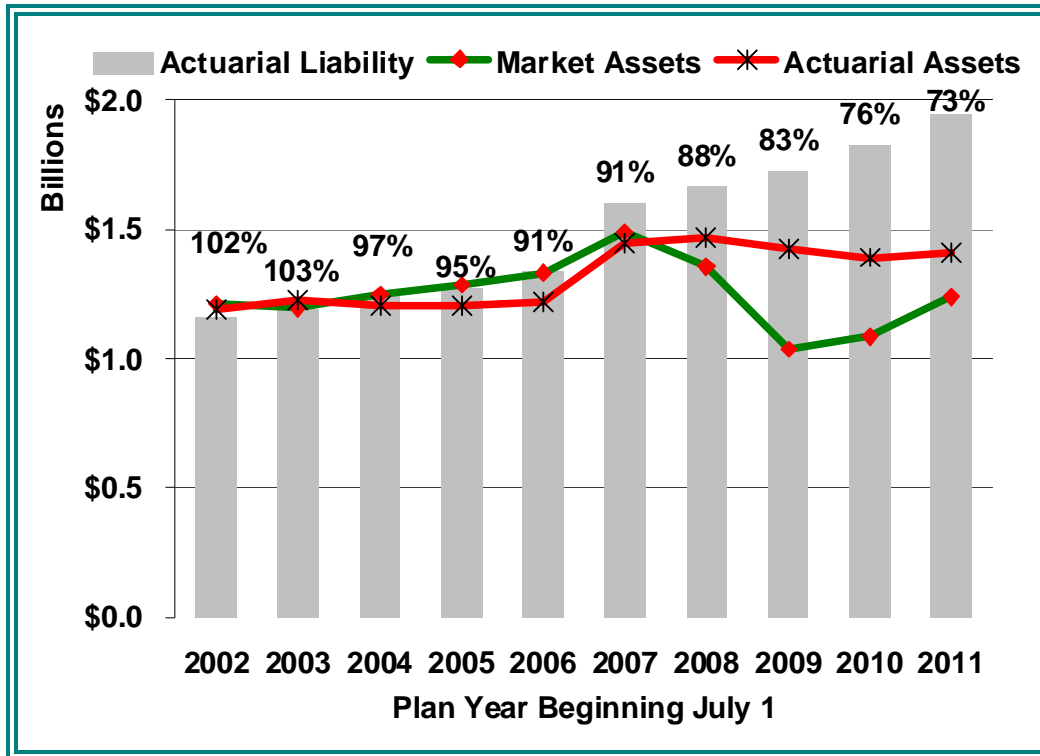
EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011

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



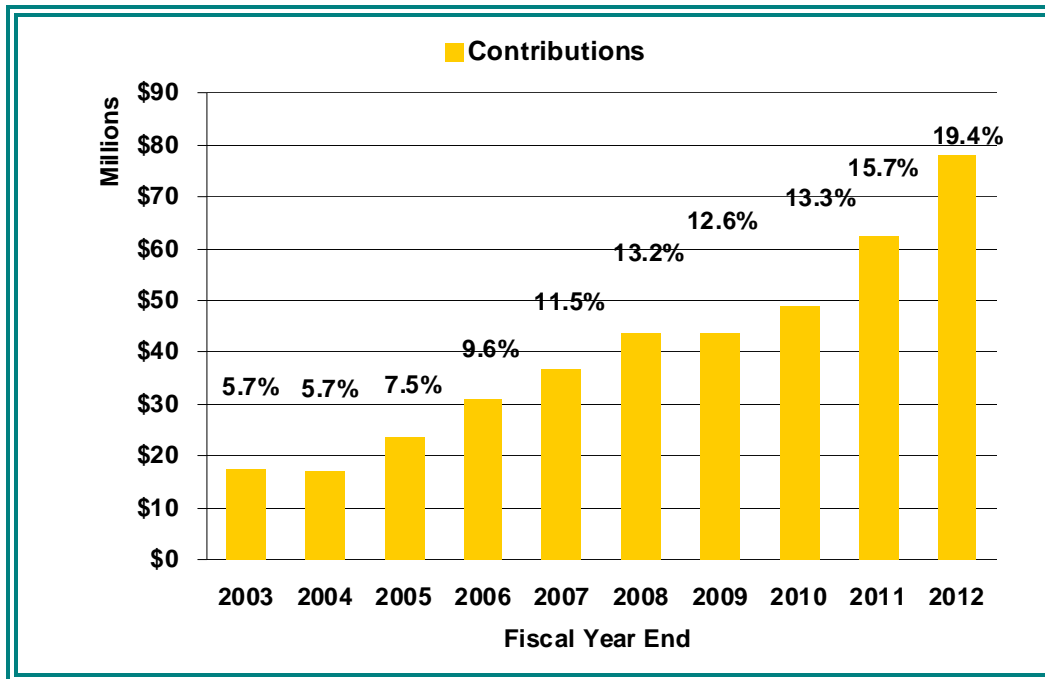
The bars represent the liability measured in this report. For funding purposes, the target amount is represented by the percent on top of the bar. We compare the actuarial assets to this measure of liability in developing the funded percent. These are the percentages shown in the graph along the top of each bar. As you can see, the System had its highest funded percentage during this decade (103%) at July 1, 2003, just after the impact of the first market decline in 2000 through 2002 which resulted in the lower funded rates through 2002 through 2006 as a function of the asset smoothing method deferring recognition of investment losses. A similar but more dramatic slow recovery is anticipated from the market decline impacting the 2008/2009 time period.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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SECTION I
SUMMARY

Contribution Rates

This graph shows the actuarially calculated City contribution rate, denominated as a percent of payroll.



The higher costs in recent years are a reflection of an increasing unfunded actuarial liability.

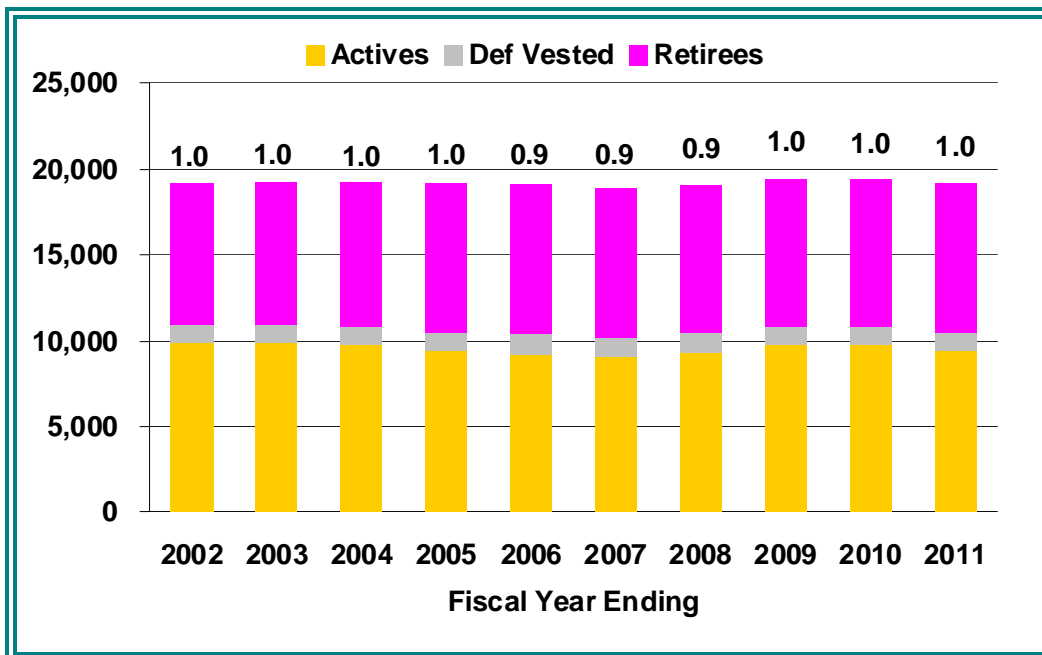
EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011

SECTION I
SUMMARY

Participant Trends

As with many public employer pension funds in this country, the ratio of active to retired members is at or below one, representing the System's maturity.

The following chart shows that the number of actives covered by the Plan has remained relatively stable over the nine-year period. The ratio of active to inactive participants has now risen to one. This trend may be due to the economic environment that less active participants are retiring when first eligible. The implications of this ratio of one active for each inactive participant is that the unfunded liabilities, which represent the System overall, is funded as a percent of payroll.

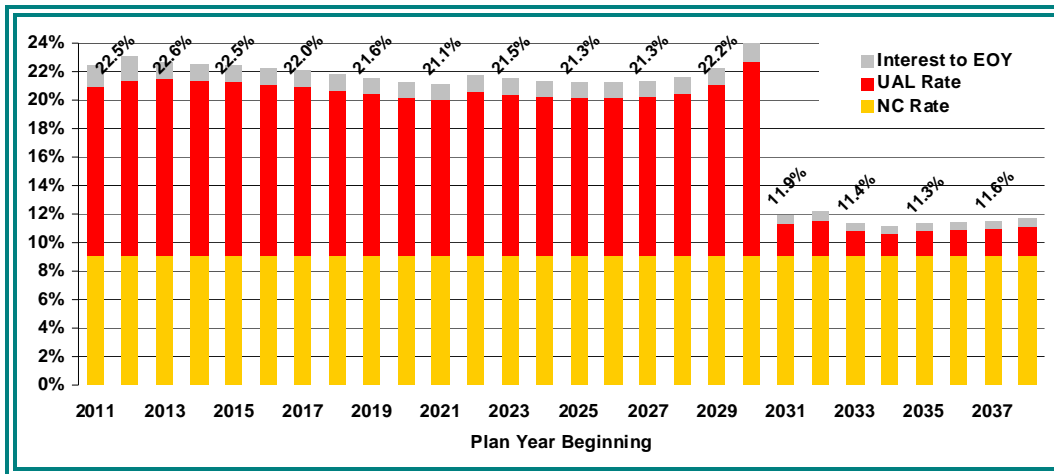


**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION I
SUMMARY**

Base Line Projections

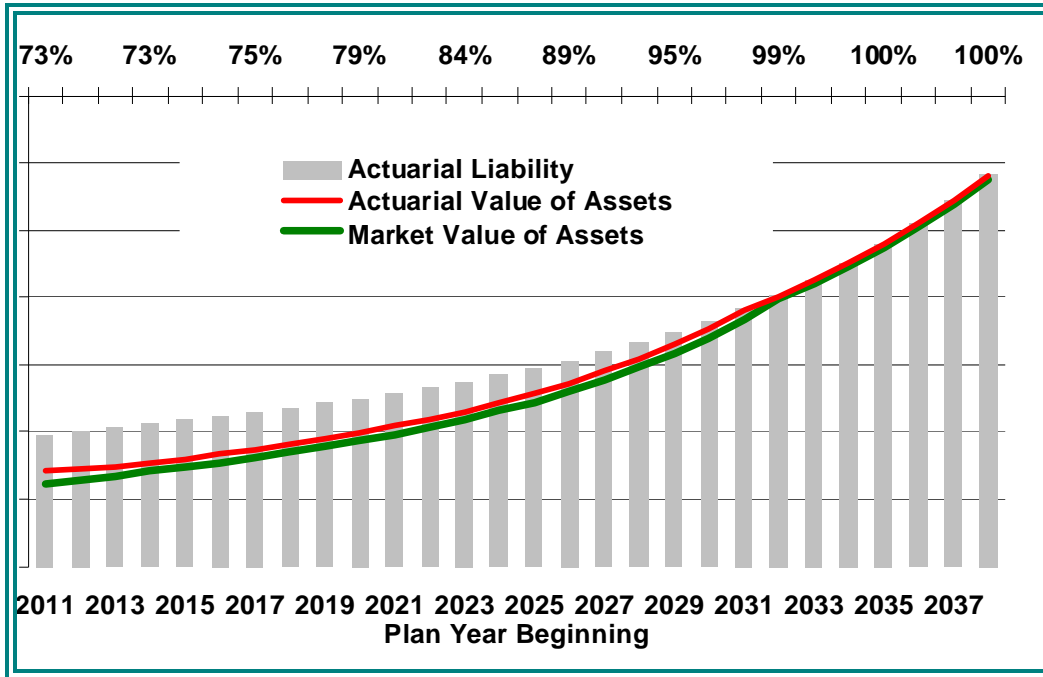
The chart on this page show the expected progress of the System's funding status over the next 25 years measured in terms of the City's contribution rate and the funding ratio assuming the long-term return rate of 7.75%. The first chart below shows that the City's composite contribution rate is projected to first increase as the balance of the 2008/2009 investment loss gets included in the actuarial asset value and then decline as a percent of payroll as the unfunded actuarial liability (UAL) gets paid down the fixed 20-year period, if all actuarial assumptions are met, including the 7.75% anticipated investment return assumption. The increase in the UAL in year 2022 is due to ending of the Ordinance 01-189 normal cost adjustment. After the 20-year period, the asset smoothing technique produces small losses, which are assumed to be paid in full to stay on target of 100% funded by the plan year beginning 2031.



EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011

SECTION I
SUMMARY

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 gradually from the current level of 73% to 100% funding in 20 years.

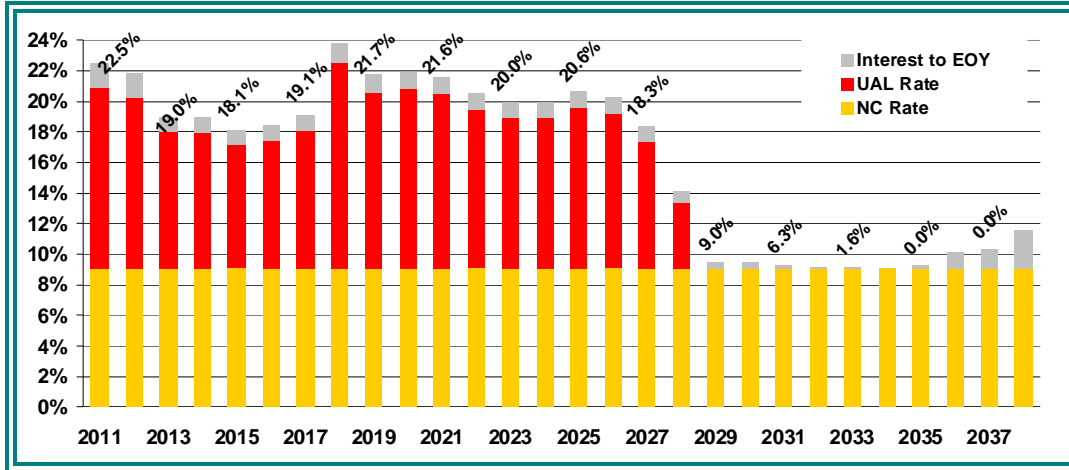


This pattern of funded status improvement is a function of the funding policy to amortize the UAL over a fixed 20-year period from 2011.

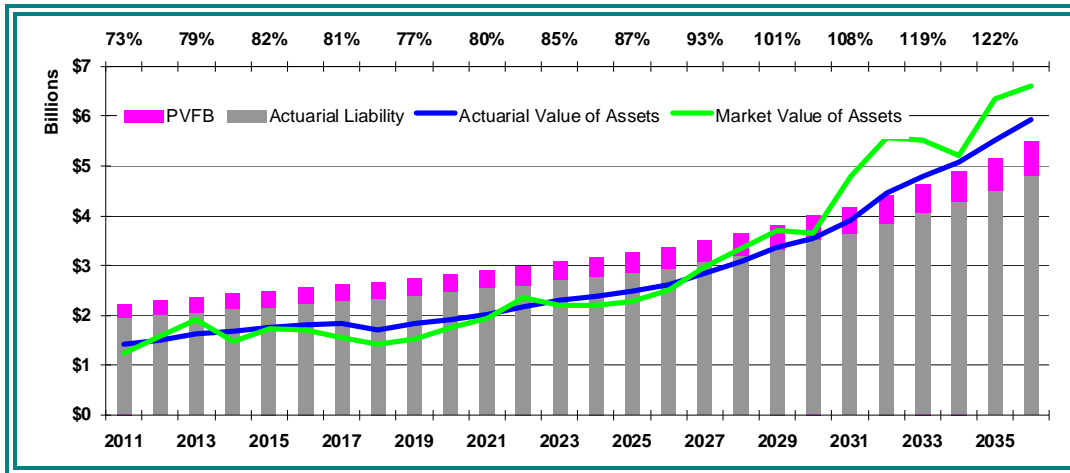
**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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**SECTION I
SUMMARY**

The next two graphs show the same information as above but reflect the fact that the 7.75% investment return is not likely to actually occur each year. Starting with actual investment return history from 1935 forward, we illustrate the potential of a projection if history repeats itself as follows.



That period of historic returns could result in a projection of future funded ratios that could look like this:



These illustrations are based on the following projected return assumption.

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
32.40%	23.12%	-19.92%	21.10%	1.36%	-4.52%	-5.88%	13.22%	16.66%	13.70%	23.48%	-4.18%	2.50%
2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
4.94%	12.60%	19.86%	13.32%	12.44%	0.76%	33.72%	19.16%	1.24%	-3.00%	25.16%	6.80%	3.94%

This illustrates a more realistic view of the potential volatility of the System and serves to assist the Board in understanding the long-term implications of the funding and funded status risks from market volatility.

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION II
ASSETS**

The assets below are based on unaudited financial data furnished by the Retirement System's Office. The change in market value of assets during the valuation year ending June 30, 2011 is summarized below.

Table II-1 Assets of the Plan as of June 30, 2011	
	<u>Total Market Value</u>
Fund Balance on 06/30/2010	\$ 1,085,191,347
Transfers	(46,945)
Adjusted Fund Balance on 06/30/2010	\$ 1,085,144,402
Contributions	
Member	\$ 62,839
Member Purchase Service	316,597
City/State	62,374,396
Net Investment Income	
Interest, Dividends, and Realized Capital Gains	\$ 20,867,280
Unrealized Gains (Losses)	190,852,638
Expenses	<u>(4,360,783)</u>
Total Investment Income	\$ 207,359,135
Administrative Expenses	\$ (3,189,932)
Payments of Benefit & Refunds	(113,382,621)
Fund Balance on 06/30/2011	\$ 1,238,684,816
Transfers	0
Adjusted Fund Balance on 06/30/2011	\$ 1,238,684,816

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION II
ASSETS**

The chart below shows the calculation of investment gains and losses. On market value, the Fund earned a 19.59% return amounting to total investment income of \$207,359,135 during FY 2010-2011. Because the liabilities are valued using different discount rates, we allocate this return over net actuarial liabilities of actives and inactive separately. The investment gain on a market basis related to the inactive liabilities using the expected return rate of 6.8% was \$135.3 million. The investment gain on a market basis related to the active liabilities using the expected return rate of 8.0% was \$122.6 million. Combining these two gains in relation to the portion of funds in each group results in a net System asset gain over the assumptions on a market value basis of \$129.3 million.

Table II-2 Development of Investment Gain/(Loss)	
1. Mean assets (see Section IV)	\$ 1,058,227,095
2. Investment return (see Section IV)	19.5900%
3. Investment Gain/(Loss)	
a. Relative to 6.80%: [(2.) – 6.80%] x (1.)	\$ 135,347,245
b. Relative to 8.00%: [(2.) – 8.00%] x (1.)	\$ 122,648,520
4. Funds as a portion of market value of assets	
a. Retired PVFB/Total PVFB	0.52478
b. (Total PVFB – Retired PVFB)/Total PVFB	0.47522
c. Total: (a.) + (b.)	1.00000
5. Total investment Gain/(Loss)	
a. Retired: (3a.) x (4a.)	\$ 71,027,065
b. Active: (3b.) x (4b.)	\$ 58,285,448
c. Total: (a.) + (b.)	\$ 129,312,514

The investment gains for FYE 2011 are taken together with past experience to determine an actuarial asset value for determining the City's contribution obligations.

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION II
ASSETS**

The chart below shows the development of the unallocated earnings which represent the earnings above and below the valuation interest assumption. The excess earnings are calculated by the “asset averaging method” from Article 22(7) (b) of the Baltimore City Code. This method uses one-fifth of the excess earnings for the year to adjust the unfunded actuarial liability in the current year. The other four-fifths of the excess earnings is used to smooth investment experience, and occasionally has been used for purposes such as benefit improvements, contribution reductions and changes in actuarial assumptions when positive. The net unallocated excess/(deficit) earnings are \$(116,653,581) at June 30, 2011. This net deficit is gradually recognized in the future actuarial value of assets and impacts future contributions to the System. However, future investment gains/(losses) may ameliorate/(exacerbate) this recognition.

**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	
	6/30/2010	6/30/2011
1. Remaining net excess earnings from prior valuation	\$ (363,740,454)	\$ (266,912,265)
2. New investment Gain/(Loss)	<u>38,009,139</u>	<u>129,312,514</u>
3. Current net excess earnings (1. + 2.)	\$ (325,731,315)	\$ (137,599,751)
4. Variable benefit funds	(7,909,017)	(8,217,226)
5. One-fifth (credit) charge (3. + 4.) ÷ 5.	<u>66,728,066</u>	<u>29,163,395</u>
6. Net unallocated excess/(deficit) earnings (3. + 4. + 5.)	\$ (266,912,265)	\$ (116,653,581)

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**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 6/30/2011	\$ 1,238,621,977
2. Net deferred recognition of unallocated excess/(deficit) earnings	\$ (116,653,581)
3. Normal Cost Reserve from Plan Change	\$ (23,059,502)*
4. Present value of prior year's contributions not yet paid	\$ 77,995,002
5. Preliminary Actuarial value of assets on 6/30/2011 (1. - 2. + 3. + 4.)	\$ 1,410,211,059**
6. Corridor Testing: 80% of market value of assets	\$ 990,897,582
120% of market value of assets	\$ 1,486,346,372
7. Final Actuarial value of assets on 6/30/2011	\$ 1,410,211,059

* A reserve from the 6/30/2000 accumulated net excess earnings was established to pay the assumed increase in normal cost due to the Ordinance 01-189 improvements.

** The actuarial value of assets represents 113.9% of the market value which is down from the same measurement least year of 128.1%.

On an actuarial asset value, the results are below expectation with an investment return for the year of 4.32%, which is compared to the liability weighted expected return of 7.37% (based on an 8% return for active participants and 6.8% return for non-active participants). This is due to the continued gradual recognition of the 2008/2009 investment losses.

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION II
ASSETS**

The chart below shows the schedule of the Normal Cost Reserve from Plan Changes. This schedule was established during the 2001 valuation year as a means of funding a benefit enhancement by reserving the full amount of the cost at a time when the actuarial asset value exceeded the liabilities. The Normal Cost Reserve, which reflects the unamortized balance, is taken out of the actuarial value of assets until valuation year 2021, at which time, the Plan Changes will be fully amortized.

Table II-5 Normal Cost Reserve from Plan Change		
<u>June 30,</u>	<u>Additional Normal Cost</u>	<u>Normal Cost Reserve</u>
2001	\$1,835,000	\$26,256,000
2002	1,908,400	26,374,680
2003	1,984,736	26,423,582
2004	2,064,125	26,393,954
2005	2,146,690	26,276,215
2006	2,232,558	26,059,887
2007	2,321,860	25,733,515
2008	2,414,734	25,284,587
2009	2,511,323	24,699,441
2010	2,611,776	23,963,167
2011	2,716,247	23,059,502
2012	2,824,897	21,970,715
2013	2,937,893	20,677,483
2014	3,055,409	19,158,757
2015	3,177,625	17,391,616
2016	3,304,730	15,351,110
2017	3,436,919	13,010,090
2018	3,574,396	10,339,025
2019	3,717,372	7,305,799
2020	3,866,067	3,875,501
2021	4,020,710	10,189

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**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 twenty 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.

**Table III-1
Liability By Employee Group**

	As of June 30, 2011			
	<u>Dept. of Education</u>	<u>Detention Services</u>	<u>All Others</u>	<u>Total</u>
Number of Participants				
Active	1,752	12	7,629	9,393
Service retired				6,435
Disabled				886
Terminated vested				1,097
Dependents				<u>1,372</u>
Total Participants				19,183
Annual compensation of active participants	\$ 65,565,505	\$ 676,872	\$ 326,698,758	\$ 392,941,135
Average Age	49.48	57.92	49.30	49.35
Average Service	11.59	30.34	14.00	13.58
Development of Unfunded Actuarial Liability				
Actuarial Liability				
Active	\$ 87,174,756	\$ 3,258,492	\$ 636,998,126	\$ 727,431,374
Retirees and dependents				1,169,599,360
Terminated vested				<u>43,416,490</u>
Total liabilities				\$ 1,940,447,224
Actuarial value of assets				
Actives	\$ 23,631,706	\$ 883,325	\$ 172,680,177	\$ 197,195,209
Retirees and dependents				1,169,599,360
Terminated vested				<u>43,416,490</u>
Total assets				\$ 1,410,211,059
Unfunded actuarial liability*	\$ 63,543,050	\$ 2,375,167	\$ 464,317,949	\$ 530,236,165

* Unfunded actuarial liability was allocated in proportion to each employee group actuarial active liability.

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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**SECTION III
LIABILITIES AND EXPERIENCE GAINS/(LOSSES)**

The table below presents the change in actuarial liabilities 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 2011 Experience Gain/(Loss)			
	Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability
1. Value as of June 30, 2010	\$ 1,830,224,519	\$ 1,390,514,840	\$ 439,709,679
a. Actives at (8%)	679,595,438		
b. Inactives and TV at (6.8%)	1,150,629,081		
2. Additions			
a. Normal Cost	\$ 33,361,407	\$	\$ 33,361,407
b. Expected Employer Contributions		62,374,397	(62,374,397)
c. Expected Member Contributions		18,154	(18,154)
3. Decreases			
a. Benefits and Expenses	\$ (113,382,621)	\$ (116,572,553)	\$ 3,189,932
4. Expected Interest			
a. On 1 for one year	\$ 132,610,413	\$ 111,241,187	\$ 21,369,226
b. On 2a for one year	2,668,913	0	2,668,913
c. On 2b for one year*	0	4,989,952	(4,989,952)
d. On 2c for ½ year	0	712	(712)
e. On 3a for ½ year	(3,791,612)	(4,573,198)	781,586
5. Expected Value June 30, 2011: (sum 1-4)	\$ 1,881,691,019	\$ 1,447,993,491	\$ 433,697,528
6. Change in methods/assumptions	\$ 72,079,154	\$ 0	\$ 72,079,154
7. Change in benefits	\$ 0	\$ 0	\$ 0
8. Expected value after changes: (sum 5-7)	\$ 1,953,770,173	\$ 1,447,993,491	\$ 505,776,682
9. Actual Value as of June 30, 2011	\$ 1,940,447,224	\$ 1,410,211,059	\$ 530,236,165
10. Actual (Gain)/Loss:	\$ (13,322,949)	\$ 37,782,432	\$ 24,459,483
11. Total (Gain)/Loss: (6+7+10)	\$ 58,756,205	\$ 37,782,432	\$ 96,538,637

* Assumes contributions made at year end.

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION III
LIABILITIES AND EXPERIENCE GAINS/(LOSSES)**

**Table III-3
Development of 2011 Experience Gain/(Loss)**

1. Unfunded Actuarial Liability at 6/30/2010	\$	439,709,679
2. Additions (normal cost and contribution)		(29,031,144)
3. Decrease (benefits and expenses)		3,189,932
4. Interest accrued*		<u>19,829,061</u>
5. Expected Unfunded Actuarial Liability at 6/30/2011 (1. + 2. + 3. + 4.)	\$	433,697,528
6. Actual Unfunded Actuarial Liability at 6/30/2011	\$	530,236,165
7. Total Gain/(Loss) at 6/30/2011 (5. – 6.)	\$	(96,538,637)

* Interest rate depends on active versus inactive.

**Table III-4
Elements of Actuarial Assets – Gain/(Loss)**

1. Change in unallocated earnings – Gain/(Loss)	\$	(150,258,684)
2. Change in Normal Cost Reserve – Gain/(Loss)		903,665
3. Asset Return – Gain/(Loss)		<u>111,572,587</u>
4. Total Actuarial Assets – Gain/(Loss)	\$	(37,782,432)

**Table III-5
Elements of Actuarial Liability – Gain/(Loss)**

1. Age and Service Retirements - Gain/(Loss)	\$	(9,939,721)
2. Disability Retirements - Gain/(Loss)		(6,647,043)
3. Death in Service Benefits - Gain/(Loss)		(3,001,208)
4. Withdrawal from Employment - Gain/(Loss)		2,992,364
5. Pay Increases - Gain/(Loss)		20,996,088
6. Death after Retirement - Gain/(Loss)		8,631,152
7. New Entrants - Gain/(Loss)		(4,431,250)
8. Assumption Changes - Gain/(Loss)		(72,079,154)
9. Other - Gain/(Loss)		<u>4,722,567</u>
10. Total Actuarial Liability - Gain/(Loss) (sum 1. to 8.)	\$	(58,756,205)

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**SECTION IV
CONTRIBUTIONS**

This table presents the components that make up the costs by employer including the normal cost reflective of the value of the benefits earned during the year, employee contributions for members under Class A membership, the proportional shares of the amortization cost to pay off the unfunded actuarial liability and the special credit normal cost defined in Ordinance 01-189, all brought forward with interest for the one year delay in funding to the next fiscal year beginning.

**Table IV-1
Contribution Summary**

	As of June 30, 2011				
	<u>Dept of Education</u>	<u>Detention Services</u>	<u>All Others</u>	<u>Total</u>	<u>% Payroll</u>
Total Normal Cost	\$ 5,586,442	\$ 87,518	\$ 29,812,349	\$ 35,486,309	9.03%
Expected Employee Contributions	<u>4,365</u>	<u>0</u>	<u>9,040</u>	<u>13,405</u>	<u>0.00%</u>
Net Normal Cost	\$ 5,582,077	\$ 87,518	\$ 29,803,309	\$ 35,472,904	9.03%
Twenty-year amortization of Unfunded Actuarial Liability	\$ 5,895,187	\$ 220,355	\$ 43,076,955	\$ 49,192,497	12.52%
Allocation from 6/30/2000 excess earnings to pay Ordinance 01-189 normal cost	<u>\$ (325,513)</u>	<u>\$ (12,167)</u>	<u>\$ (2,378,567)</u>	<u>\$ (2,716,247)</u>	<u>-0.69%</u>
Net plan cost at 7/1/2011	\$ 11,151,751	\$ 295,706	70,501,697	81,949,154	20.86%
Interest to 7/1/2012	<u>\$ 864,261</u>	<u>\$ 22,917</u>	<u>\$ 5,463,882</u>	<u>\$ 6,351,060</u>	<u>1.62%</u>
Net plan cost at 7/1/2012	\$ 12,016,012	\$ 318,623	\$ 75,965,579	\$ 88,300,214	22.47%

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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**SECTION V
VARIABLE BENEFIT**

Below is the development of the variable benefit. The amended retirement ordinance provides for an automatic increase in benefits to certain retirees and beneficiaries of 1.5% for under age 65 and 2.0% for 65 and older, plus whenever the market value investment performance exceeds 6.8%, an additional variable benefit increase is granted up to the CPI (Consumer Price Index) for the year. During FYE 2011, the Fund earned 19.59% on a market value basis. The CPI for the year ending June 30, 2011 is 3.56%. The net variable benefit is subject to the limitation of the CPI. An additional benefit increase will be granted in addition to the guaranteed 1.50%/2.00% cost-of-living adjustment as listed below.

**Table V-1
Variable Increase Calculation**

1. Market Value of assets as of 6/30/2010	\$ 1,085,191,347
2. Market Value of assets as of 6/30/2011	\$ 1,238,621,977
3. Earnings during 7/30/2010 to 6/30/2011 (including expenses)	\$ 207,359,135
4. Mean Assets Half of [1. + 2. - 3.]	\$ 1,058,227,095
5. Investment return 2010-2011 (3. ÷ 4.)	19.59%
6. Earnings between 6.8% and 8.0% (Excess of (5.) over 6.8%, but not more than 1.2%) ÷ (5.) x (3.)	\$ 12,701,938
7. Present Value of Retirees and Beneficiaries on 6/30/2011	\$ 1,169,599,360
8. Total Present Value of Benefits on 6/30/2011	\$ 2,228,756,752
9. Present Value of Future Normal Cost on 6/30/2011	\$ 288,309,528
10. Market Value of Assets on 6/30/2011	\$ 1,238,621,977
11. Retired Life portion of Market Value of Assets on 6/30/2011	\$ 801,297,903
12. Current Year Assets available for Variable Increase [(6.) x (11.) ÷ (10.)]	\$ 8,217,226
13. Prior Year Carryover Earnings Increase for Variable Increase	\$ 9,458,393
14. Total Assets available for Variable Increase [12. + 13.]	\$ 17,675,619
15. Cost to provide each additional 1%	\$ 10,923,301
16. Compound Increase [(14.) ÷ (15.)] x 1%	1.62%
17. Consumer Price Index for year ending 6/30/2011	3.56%

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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**SECTION V
VARIABLE BENEFIT**

Variable Increase Calculation for Members age 65 and Older		
18. Net maximum variable increase (CPI – 2.0% [guaranteed COLA])		1.56%
19. Cost to provide each additional 1% for retirees 65 and older	\$	6,244,919
20. Variable increase for eligible members age 65 and older [minimum of 18. or (14. divided by 19. x 1%)]		1.56%
21. Cost to provide variable increase for members age 65 and older [19. x 20. x 100]	\$	9,734,757
Variable Increase Calculation for Members Under age 65		
22. Assets available for Variable Increase for under age 65 [14. - 21.]	\$	7,940,862
23. Net maximum variable increase (CPI - 1.5% [guaranteed COLA])		2.06%
24. Cost to provide each additional 1% for members under age 65	\$	4,678,382
25. Variable increase for eligible members under age 65 [minimum of 23. or (22. divided by 24. x 1%)]		1.70%
26. Cost to provide variable increase for members under age 65 [22. x 25. x 100]	\$	7,940,862
27. Total cost to provide variable increase [21. + 26.]	\$	17,675,619
28. Net carryover Earnings Increase Account [27. – 14.]	\$	0
The variable benefit increase is applied to members with benefits in payment on June 30, 2010.		

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**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, 2011. Where data elements were missing, dates of hire, dates of birth, and benefit accrual level assumptions were made to fill-in the blanks. The assumed values are included in Appendix B.

The following pages contain a summary of the data provided.

- Reconciliation of active members as of June 30, 2011
- Reconciliation of terminated vested members as of June 30, 2011
- Reconciliation of retirees and beneficiaries as of June 30, 2011
- Age/service and age/salary/service distribution for active members as of June 30, 2011
- Counts and average benefit amount by age for retirees, beneficiaries and disabled members as of June 30, 2011

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011

**APPENDIX A
PLAN MEMBERSHIP**

Reconciliation of Active ERS Members			
	<u>Class A</u>	<u>Class C</u>	<u>Total</u>
A. Active Members as of June 30, 2010	42	9,638	9,680
B. Exits:			
1. Terminations: Non-vested	0	427	427
Vested	0	84	84
2. Transfers Out	0	10	10
3. Leaves: Military	0	0	0
Other	0	8	8
4. Prior Incorrect inclusions	0	7	7
5. Deaths: Ordinary with no Survivor	1	22	23
Accidental with Survivor	0	0	0
Ordinary with Survivor	0	5	5
6. Retirements: Service	6	273	279
7. Disablements: Ordinary	0	51	51
Accidental	0	0	0
Accidental – Special	0	0	0
Pending	0	0	0
8. Other Exits:	0	0	0
9. Subtotal (all exits):	7	887	894
C. Remaining Active (A. – B.9)	35	8,751	8,786
D. Entrances:			
1. New Entrants	0	491	491
2. Prior Omissions	1	96	97
3. Transfers In	0	0	0
4. Restorations: Pending	0	0	0
Leave	0	0	0
Retirement	0	6	6
Disability – Ordinary	0	0	0
Disability – Special	0	0	0
Other Termination	0	13	13
5. Subtotal (all entrances):	1	606	607
E. Active Members as of June 30, 2011 (C. ÷ D.5)	36	9,357	9,393
F. Members included in the valuation as of June 20, 2011 (E. + Pending Disablements in B.7)	36	9,357	9,393

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011

APPENDIX A
PLAN MEMBERSHIP

Reconciliation of Terminated Vested ERS Members	
A. Terminated Vested Members as of June 30, 2010	1,094
B. Exits:	
1. Retirements	44
2. Restorations	13
3. Transfers Out of State Plan	0
4. Prior Incorrect Inclusions	0
5. Deaths	6
6. Lump Sum Payment	8
7. Other Exits	<u>29</u>
8. Subtotal (all exits):	100
C. Remaining Terminated Vested (A. – B.7)	994
D. Entrances:	
1. New Entrants	84
2. Prior Omissions	<u>19</u>
3. Subtotal (all entrances)	103
E. Terminated Vested Members as of June 30, 2011	1,097

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011

**APPENDIX A
PLAN MEMBERSHIP**

Reconciliation of Retired ERS Members and their Beneficiaries					
	Retired		Disabled		
	<u>Primary</u>	<u>Beneficiary</u>	<u>Primary</u>	<u>Beneficiary</u>	<u>Total</u>
A. Members as of June 30, 2010	6,416	1,106	881	234	8,637
B. Exits:					
1. Beneficiary Payments Ceased	0	0	0	0	0
2. Returned to Active Membership	6	0	0	0	6
3. Prior Incorrect Inclusion	2	0	0	1	3
4. Deaths: Primary with no Survivor	215	0	34	0	249
Beneficiary	0	76	0	4	80
Primary with Survivor	<u>75</u>	<u>0</u>	<u>24</u>	<u>0</u>	<u>99</u>
5. Subtotal (all exits):	298	76	58	5	437
C. Remaining Members (A. – B.5)	6,118	1,030	823	229	8,200
Adjustments					
Adjusted Remaining Members	6,118	1,030	823	229	8,200
D. Entrances:					
1. New Retirements: Primary	271	0	57	0	328
2. Retired from Terminated Vested	41	0	3	0	44
3. Active Death: Beneficiary	0	5	0	0	5
4. Beneficiary Assumes Payments	0	75	0	24	99
5. Prior Omissions	5	9	3	0	17
6. Ex-Spouse Receiving Payments	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
7. Subtotal (all entrances):	317	89	63	24	493
E. Members as of June 30, 2011 (C. + D.7)	6,435	1,119	886	253	8,693

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**APPENDIX A
PLAN MEMBERSHIP**

AGE/SERVICE DISTRIBUTION OF ACTIVE PARTICIPANTS

ACTIVE PARTICIPANTS AS OF JUNE 30, 2011

AGE	COMPLETED YEARS OF CREDITED SERVICE									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	
Under 25	60	1	4	0	0	0	0	0	0	65
25-29	344	99	6	0	0	0	0	0	0	449
30-34	382	236	48	1	0	0	0	0	0	667
35-39	312	259	175	30	6	0	0	0	0	782
40-44	337	285	195	95	84	2	0	0	0	998
45-49	301	329	243	144	256	95	1	0	0	1,369
50-54	287	259	289	175	320	227	132	2	0	1,691
55-59	206	219	214	141	265	203	271	88	3	1,610
60-64	135	148	154	77	168	121	178	127	50	1,158
65-69	39	67	62	34	66	40	53	20	27	408
70 & Up	23	27	32	13	27	19	28	8	19	196
Total	2,426	1,929	1,422	710	1,192	707	663	245	99	9,393
	Average Age = 49.35					Average Service = 13.58				

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**APPENDIX A
PLAN MEMBERSHIP**

**AGE/SERVICE DISTRIBUTION OF ACTIVE PARTICIPANTS
ACTIVE PARTICIPANTS AS OF JUNE 30, 2011**

AGE	AVERAGE EARNINGS									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	
Under 25	\$ 27,449	\$ 29,349	\$ 42,652	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 28,414
25-29	34,076	33,949	39,463	0	0	0	0	0	0	34,120
30-34	40,183	40,203	34,627	29,723	0	0	0	0	0	39,775
35-39	41,984	42,444	45,689	41,771	50,869	0	0	0	0	43,026
40-44	40,012	37,750	44,140	45,174	43,582	43,780	0	0	0	40,972
45-49	40,890	38,616	40,659	45,143	47,771	44,885	43,327	0	0	42,316
50-54	38,001	37,077	35,282	39,123	44,740	49,960	50,876	52,303	0	41,413
55-59	37,723	40,558	36,880	40,203	43,048	47,877	50,842	50,902	48,345	43,319
60-64	44,146	35,418	43,717	43,162	46,688	48,758	50,974	51,868	49,775	45,898
65-69	33,824	36,370	36,986	40,831	41,971	52,197	43,256	45,617	47,342	41,123
70 & Up	28,903	30,434	31,897	28,164	38,925	52,447	37,802	44,539	39,009	36,106
Total	\$ 38,842	\$ 38,528	\$ 39,865	\$ 41,786	\$ 44,954	\$ 48,650	\$ 49,716	\$ 50,775	\$ 47,002	\$ 41,833
Total Earnings = \$ 392,941,135					Average Earnings = \$ 41,833					

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**APPENDIX A
PLAN MEMBERSHIP**

**Schedule of Benefit Recipients by Attained Age and Type of Retirement - ERS
June 30, 2011 - Primary Members**

AGE	TYPE OF RETIREMENT					Total
	NR	ER	DS	ODis	ADis	
Under 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	1	0	1
30-34	0	0	0	8	0	8
35-39	0	0	1	15	0	16
40-44	3	0	13	51	2	69
45-49	36	0	78	132	3	249
50-54	217	171	171	159	12	730
55-59	461	372	185	163	7	1,188
60-64	641	379	157	109	7	1,293
65-69	579	340	124	78	12	1,133
70-74	508	375	111	54	10	1,058
75-79	443	231	77	25	11	787
80-84	341	138	34	13	4	530
85 & Up	201	44	4	6	4	259
Total	3,430	2,050	955	814	72	7,321
Average Annual Benefit	\$ 19,088	\$ 6,321	\$ 18,393	\$ 8,315	\$ 19,086	\$ 14,225

NR - Service Retirement
ER - Early Retirement
DS - Discontinued Service
ODis - Ordinary Disability
ADis - Accidental Disability

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**APPENDIX A
PLAN MEMBERSHIP**

**Schedule of Benefit Recipients by Attained Age and Type of Retirement - ERS
June 30, 2011 - Beneficiaries**

AGE	TYPE OF RETIREMENT							Total
	NR	ER	DS	ODis	ADis	ODth	ADth	
Under 20	3	1	2	13	0	2	0	21
20-24	1	0	1	1	0	0	0	3
25-29	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0
35-39	0	0	1	0	0	0	0	1
40-44	0	0	0	2	1	0	0	3
45-49	3	2	0	5	0	2	0	12
50-54	17	4	4	9	1	5	0	40
55-59	35	10	4	25	0	11	0	85
60-64	45	15	11	38	2	11	0	122
65-69	61	26	17	28	1	14	0	147
70-74	76	40	5	36	3	14	2	176
75-79	112	52	16	30	3	20	4	237
80-84	132	40	9	21	5	12	4	223
85 & Up	205	35	6	27	2	17	10	302
Total	690	225	76	235	18	108	20	1,372
Average Annual Benefit	\$ 8,553	\$ 3,616	\$ 9,280	\$ 4,994	\$ 9,328	\$ 10,467	\$ 21,087	\$ 7,517

NR - Service Retirement
ER - Early Retirement
DS - Discontinued Service
ODis - Ordinary Disability
ADis - Accidental Disability
ADth - Accidental Death

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

Highlights

There have been several changes to actuarial assumptions from the 2010 valuation.

Due to an experience study performed during 2011 and presented on October 31, 2011, there were changes to the demographic and economic assumptions as well as the funding method.

1. Demographic Assumption changes were as follows:
 - a. Rates of retirement
 - b. Rates of Termination
 - c. Form of Benefit for disabled members
 - d. Percent Married
 - e. Social Security Wage Base
2. Economic Assumption changes were as follows:
 - a. Inflation
 - b. Regular Interest Rate Pre Retirement
 - c. Regular Interest Rate Post Retirement
 - d. Salary Growth Rate
3. Funding Method changes were as follows:
 - a. Corridor on Asset Smoothing Method
 - b. Amortization of Unfunded Liability

Projected Unit Credit Method

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.

**EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011**

**APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS**

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 B
ACTUARIAL ASSUMPTIONS AND METHODS

Actuarial Assumptions and Methods (Changes are highlighted in gray)

Method of Funding: The Projected Unit Credit Funding Method has been in use since the effective date of 7/1/1989, in accordance with Ordinance 275.

The current unfunded actuarial liability is amortized as a level dollar figure over 20 years. The 20-year period decreases each year from 2011 until 2031, at which time the unfunded liability will be fully paid each year.

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. Expected earnings are 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.
2. The current net excess earnings are computed by adding the investment gain or loss for the current year to the remaining excess earnings for the prior valuation.
3. The actuarial value of assets will not be greater than 120% nor less than 80% of the market value of assets as of the valuation date.

Discount Rate: 7.75% compounded annually until retirement except employee accumulations; 6.55% compounded annually after retirement (effective 6/30/2011).

Investment Return: A liability weighted return on assets is expected on the basis that an 8.0% return is achieved on the portion of assets attributable to active participants, and a 6.8% return is assumed for non-active based assets. The weighted expected return this year is 7.36%. The liability weighted return on assets for next year's valuation will be based on the rates listed in the discount rate section above.

Social Security Wage Base: 3.00% per year compounded annually (effective 6/30/2011)

Inflation: 2.75% (effective 6/30/2011)

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
ACTUARIAL VALUATION AS OF JUNE 30, 2011

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

Salary Increases: Salary increases are assumed to vary with age. Sample rates are as follows:

Age	Salary
20	6.70%
25	6.35
30	5.78
35	5.20
40	4.68
45	4.23
50	4.00
55	4.00
60	4.00
65	4.00
69	4.00

Cost-of-Living Adjustment Assumption: 1.5% for inactives in pay status under age 65 and 2.0% over age 65, plus variable based on excess returns assumed to be zero.

Percent Married: Males 90%, females 80%.

Spouse Age: A husband is assumed to be 4 years older than his wife.

Remarriage Rates: None

Expenses: Administration and investment expenses are assumed to be paid out of investment earnings. It is assumed that the Fund will have sufficient earnings to pay these expenses and meet the interest assumption.

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Withdrawal:

Service	Rate
0	14.50%
1	14.25
2	10.50
3	8.25
4	7.00
5	6.75
6	6.25
7	5.75
8	5.75
9	5.00
10	4.75
11	4.75
12	4.75
13	4.25
14	4.25
15+	4.25

Disability:

The Line-of-Duty disability rates for classes A and B were effective 6/30/1999; class C disability rates and Non-Line-Of-Duty rates are effective 6/30/2002.

Age	Non-Line-of-Duty Disability	Line-of-Duty Disability (Classes A&B)	Line-of-Duty Disability (Class C)
25	0.00050	0.00004	0.00008
30	0.00059	0.00004	0.00008
35	0.00115	0.00008	0.00016
40	0.00236	0.00008	0.00016
45	0.00425	0.00012	0.00024
50	0.00675	0.00020	0.00039
55	0.01043	0.00024	0.00047
60	0.00579	0.00027	0.00055
65	0.00130	0.00038	0.00076
69	0.00078	0.00039	0.00078

Workers compensation offset is included in the above rates.

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***Pre-Retirement
Mortality:***

1. Non-line-of-Duty - 1994 Uninsured Pensioners Generational Mortality table (Male + 4, Female + 1) with generational projections using 50% of the AA scale projected to 2016.
2. Line-of-Duty - 0.005% at all ages (effective 6/30/1999).

Age	Non-Line-of-Duty Death*	Non-Line-of-Duty Death*	Line-of-Duty Death*
	Male	Female	
25	0.00082	0.00031	0.00005
30	0.00090	0.00039	0.00005
35	0.00106	0.00054	0.00005
40	0.00154	0.00080	0.00005
45	0.00242	0.00107	0.00005
50	0.00409	0.00162	0.00005
55	0.00727	0.00270	0.00005
60	0.01337	0.00541	0.00005
65	0.02256	0.01029	0.00005
69	0.03127	0.01440	0.00005

* Rates for individuals who are the age shown as of June 30, 2011.

***Post-Retirement
Mortality:***

1. Retirees and Beneficiaries:
Males and Females - 1994 Uninsured Pensioners Generational Mortality table (Male + 4, Female + 1) with generational projections using 50% of the AA scale projected to 2016.
2. Disabled members:
Sample rates (rates effective 6/30/2002).

Age	Retirees and Beneficiaries*		Disabled Members	
	Male	Female	Male	Female
55	0.00727	0.00270	0.05392	0.02529
60	0.01337	0.00541	0.06435	0.03138
65	0.02256	0.01029	0.07679	0.04088
70	0.03526	0.01588	0.09558	0.05568
75	0.05799	0.02669	0.12298	0.07841
80	0.09397	0.04644	0.16115	0.11274

* Rates for individuals who are the age shown as of June 30, 2011

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Service Retirement: Early Retirement prior to the later of age 60 and eligibility for Normal Retirement (earlier of age 65 with 5 years of service and 30 years of service).

Age	Rates of Retirement		
	Less than 30 yos	30 yos	30 or more yos
45-54	0.00	0.20	0.10
55-56	0.06	0.20	0.10
57	0.06	0.20	0.10
58	0.06	0.20	0.10
59	0.06	0.20	0.10
60	0.07	0.20	0.15
61	0.10	0.20	0.20
62	0.17	0.20	0.40
63-64	0.15	0.20	0.20
65	0.20	0.20	0.35
66	0.20	0.20	0.25
67	0.17	0.20	0.25
68	0.17	0.20	0.20
69	0.20	0.20	0.20
70	1.00	1.00	1.00

Normal Retirement is assumed on or after the later of age 60 and eligibility for Normal Retirement (earlier of age 65 with 5 years of service and 30 years of service).

***Joint and Survivor
Forms of Payment:***

The 40% Joint & Survivor form of payment is assumed for all benefits. All benefits with Joint & Survivor Forms of Payment for retirees had their survivor benefits increased by 4% to account for children's benefits.

Data Assumptions:

The data provided for this valuation had several participants missing salaries. We assumed the average salary by service for these participants.

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Highlights

It has been represented to us that there were no changes in plan provisions from the 2010 valuation.

Effective Date

The System was effective January 1, 1926 and has been periodically amended.

Eligibility

Any regular and permanent officer, agent, or employee of the City with the exception of those required to join the Maryland State or any other Retirement System shall become a Class C member of the Employees' Retirement System upon completion of one year of service. The Board of Estimates may authorize prospective membership for any class of part-time employees. There are three classes of members as follows:

1. Class A – Members who were hired before July 1, 1979, and entered membership on or after January 1, 1954, or who elected, prior to April 1, 1954, to contribute at the higher Class A rate. Any Class B member may elect to become a Class A member by bringing his accumulated contributions and interest up to what they would be if he had elected Class membership on January 1, 1954.
2. Class B – Members as of January 1, 1954 who did not elect Class A membership.
3. Class C – Members who were hired on or after July 1, 1979, or any other members who may have elected to transfer during various open transfer periods.

Member Contributions

Class C members make no contributions. All other members currently contribute at the rate of 4% of earnable compensation. Contributions are not required upon attaining age 60 and completing 35 years of service. Interest is credited on contributions at a rate of 5.5% per annum.

Compensation

Earnable compensation is the annual salary authorized for the member, not including overtime, differential pay, environmental pay, hazardous duty pay, pay for conversion of leave or other fringe benefits, or any like additional payment. Average Final Compensation is the average of the member's annual earnable compensation on January 1 for the three successive years of service when the member's earnable compensation is the highest or, if the member is in service on January 1 for less than three successive years, than the average during total service.

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Covered Compensation

The covered compensation (for Class C only) is the average of the FICA wage base for the 35 year period ending with the calendar year which ends immediately prior to the earlier of: (1) January 1, employment; or (2) January 1, of the calendar year in which the member attains age 65.

Military Service Credit

A. Military Service Prior to Employment:

1. Classes A and B

A maximum of 3 years service credit is granted provided the member has acquired 10 years of service and has reached the age of 60 or has acquired 20 years of service, regardless of age.

2. Class C

A maximum of 3 years service credit is granted provided the member has acquired 10 years of service and has reached the age of 62 or has acquired 20 years of service, regardless of age.

B. Military Service Within Employment:

1. Classes A and B

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

Retirement Eligibility

A. Service Retirement:

1. Classes A and B – Age 60 with 5 years of service or 30 years of membership service.

2. Class C – Age 65 with 5 years of service or 30 years of service, regardless of age. Early retirement allowed at age 55 with 5 years of service payable at age 65 or reduced for payment before 65.

B. Non-Line-of-Duty Disability Retirement:

Five years of membership service and determined by a hearing examiner to be mentally or physically incapacitated for the performance of duty and that incapacity is likely to be permanent.

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C. Line-of-Duty Disability Retirement:

Totally and permanently incapacitated for duty as the result of an accident while in performance of duty and certified by a hearing examiner as mentally or physically incapacitated for the performance of duty and that such incapacity is likely to be permanent.

D. Dismemberment Disability Retirement:

1. Class C – Loss of any 2 or more of hands, feet, sight of eye(s) as a direct result of bodily injury from an accident while in actual performance of duty as determined by a hearing examiner.

Termination of Employment

1. Classes A and B

- a. Eligible for Termination Retirement Allowance, deferred to age 60, upon completion of (1) 15 years of membership service, or (2) 5 years of service, if removed from a position without fault.
- b. Eligible for a Termination Retirement Allowance, payable immediately, upon completing 20 years of service, if removed from a position without fault.
- c. Eligible for a refund of accumulated contributions if not eligible for any other benefits.

2. Class C

- a. Eligible for a Termination Retirement Allowance, deferred to age 65, upon completion of (1) 10 years of service, or (2) 5 years of service, if removed from a position without fault.
- b. Eligible for an immediate benefit if removed without fault after 20 years of service.

Retirement Allowances

A. Service Retirement:

1. Classes A and B

The sum of:

1. An annuity of the actuarial equivalent of a member's accumulated contributions; and
2. A pension, which together with the annuity shall equal 1.935% (Class A) or 1.785% (Class B) of Average Final Compensation times years of service.

2. Class C

A pension of (1) 1.60% of Average Final Compensation, times years of service up to 30 years, plus (2) 0.25% of Average Final Compensation in excess of Covered Compensation, times years of service up to 30 years, plus (3) 1.85% of Average Final Compensation, times years of service in excess of 30 years.

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B. Early Retirement:

1. Class C

If a member is age 55 with 5 years of service, the member may retire at any time, with a benefit reduced for early commencement. The reduction factor is 1/180 for each of the first 60 months prior to age 65 and 1/360 for each additional month preceding age 65. If the member has 30 years of service at retirement, then there is no reduction factor applied to the benefit.

C. Non-Line-of-Duty Disability Retirement:

1. Classes A and B

A benefit equal to the service retirement benefit if age 60; otherwise, an annuity of the actuarial equivalent of a member's accumulated contributions plus a pension which, together with the annuity, shall equal 1.90% (Class A) or 1.75% (Class B) of Average Final Compensation times years of service.

The member will receive the benefit as calculated above if the benefit exceeds 25% of the member's Average Final Compensation. Otherwise, the member shall receive 25% of the member's Average Final Compensation.

This benefit is offset by:

1. Worker's compensation (excluding amounts paid to third parties);
2. Earnings in excess of base amount (current earnable compensation in same job grade and step adjusted for longevity) with a \$1.00 reduction for each \$2.00 of the first \$5,000 of excess and a \$2.00 reduction for each \$5.00 of additional excess earnings.

2. Class C

The ordinary disability pension shall be equal to the greater of:

1. The member's accrued service retirement benefit; or
2. 15% of the member's average final compensation.

This benefit is offset by:

1. Worker's compensation (excluding amounts paid to third parties);
2. Unemployment compensation.

D. Line-of-Duty Disability Retirement:

An annuity of the actuarial equivalent of a member's accumulated contributions, plus a pension equal to 66-2/3% of Average Final Compensation.

This benefit is offset by:

Same offsets are applied as for non-line of duty disability.

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E. Dismemberment Disability Retirement:

1. Class C

A pension, equal to 100% of Average Final Compensation. Same offsets as for Class C Line-of-Duty Disability benefits.

F. Termination Retirement Allowance (Deferred Payment):

Determined the same as for Service Retirement, but based on membership service and Average Final Compensation at the time of termination.

G. Termination Retirement Allowance (Immediate Payment):

Determined the same as if the member had retired with a non-line-of-duty retirement allowance.

Option Methods of Receiving Benefit Payments

A. Maximum Service Retirement:

Joint & Survivor form of payment to unmarried spouse or dependent children until the last marries, dies or attains age 18 (age 22 if a full-time student). The percent continued to the spouse is 40%.

B. Cash refund to retiree's beneficiary 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

These options are available for service, termination, non-line-of-duty disability and line-of-duty disability retirement. Any option and / or beneficiary may be changed by the retired member within 30 days after retirement.

Non-Line-of-Duty-Death Benefits

1. Class A and B

- The member's accumulated contributions will be returned; plus, if one or more years of membership service, 50% of the greater of Average Final Compensation or current annual earnable compensation, or
- If (1) eligible for service retirement, or (2) would have become eligible for service retirement within 90 days, or (3) if retired on account of service, non-line-of-duty disability, or line-of-duty disability and dies within 30 days of retirement, or (4) entitled to a deferred allowance at age 60; and the member's designated beneficiary is his spouse

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with whom he has been living for at least 5 years or his partner(s), such beneficiary may elect, in lieu of paragraph(1) above, an allowance equal to the greater of 40% of the participant's accrued benefit or the amount that would have been paid under the Joint and 100% Contingent Option.

This benefit is offset by worker's compensation (excluding amounts paid to third parties). If no beneficiary and if intestate without heirs, then contributions shall remain part of the System.

2. Class C

- If (1) eligible for service retirement, or (2) would have become eligible for service retirement within 90 days, or (3) if retired on account of service, ordinary disability, or accidental disability and dies within 30 days of retirement, or (4) entitled to a deferred allowance at age 65, or (5) has 20 years of service and dies anytime between effective retirement date at age 65 and no later than 30 days following the attainment of age 65; and the member's designated beneficiary shall receive an allowance equal to the greater of 40% of the participant's accrued benefit or the amount that would have been paid under the Joint and 100% Contingent Option, or
- If (1) not eligible under paragraph (1) above, and (2) if one or more years of service, 50% of the greater of Average Final Compensation or current annual earnable compensation, shall be paid as a lump sum.

Line-of-Duty Death Benefits

If a member's death was the result of injuries in the line of duty, a refund of contributions shall be payable, if applicable. In addition, an annual pension of 100% of current earnable compensation (not less than \$10,000 on June 30, 1994) shall be payable to:

- A. The spouse, provided there is no voluntary separation agreement renouncing rights of inheritance during her widowhood;
- B. If no eligible spouse, or if the spouse dies or remarries, the child or children equally until age 18 (age 22 if full-time student(s));
- C. If no eligible spouse or child surviving, then to the deceased's father and / or mother equally, or to the survivor;
- D. For Classes A and B, any member who retires and dies within 30 days after the effective date of line-of-duty disability retirement shall receive the above benefits if death is the result of injuries in the line of duty.

This benefit is offset by worker's compensation (excluding amounts paid to third parties). If no beneficiary and if intestate without heirs, then contributions shall remain part of the System.

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Post-Retirement Benefit Increases

Annual post-retirement benefit increases of a fixed 1.5% for participants in pay status under age 65 and 2.0% for participants in pay status age 65 and over.

Post-Retirement Benefit Increases (Variable Increase)

Additional increases may be provided when investment performance exceeds 6.55% provided for all participants in pay status for more than 18 months.