



Employees' Retirement System of the City of Baltimore

Experience Study Results and Recommendations

Produced by Cheiron

August 2015

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LETTER OF TRANSMITTAL

August 20, 2015

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

Dear Board Members:

At your request, we have completed an experience study of the Employees' Retirement System of the City of Baltimore. Our study compares assumed versus actual experience with respect to all demographic and economic assumptions used in the preparation of the Actuarial Valuations for the four year period from July 1, 2010 through June 30, 2014.

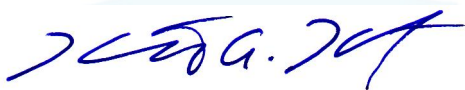
This report presents the results of our study as well as alternative assumptions for consideration for changes to several of the actuarial assumptions to be employed for the July 1, 2015 Actuarial Valuation. It also includes the estimated cost impact of these assumption changes.

In preparing our report, we relied 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. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice #23.


This actuarial valuation report was prepared exclusively for the Employees' Retirement System of the City of Baltimore for the purposes as stated above. Other users of this experience study report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

We hereby certify that, to the best of our knowledge, this experience study 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 experience study does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

Sincerely,
Cheiron

A handwritten signature in blue ink, appearing to read "K. Kent".

Kenneth Kent, FSA, FCA, MAAA
Principal Consulting Actuary

A handwritten signature in blue ink, appearing to read "Anu Patel".

Anu Patel, FSA, MAAA, EA
Consulting Actuary

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

SECTION I
BOARD SUMMARY

At the request of the Board, Cheiron has performed a study of experience of the Employees' Retirement System of the City of Baltimore (ERS). This experience study examines the System's experience during the four year period from July 1, 2010 through June 30, 2014. This report presents the results of our study and alternative assumptions for the Board's consideration.

We studied the System's experience with respect to both "demographic" and "economic" assumptions. Demographic assumptions are those that predict the behavior of the individual members. These include the retirement rates, withdrawal rates, disability rates, mortality, and salary increases due to merit/seniority.

In our study, we classify economic assumptions as investment return, salary increase rates, inflation and administrative expenses.

The key finding of this experience study is that, in the aggregate, the actuarial assumptions employed in the valuation process may not be sufficiently conservative enough to avoid producing on-going experience losses. This is supported by consistent losses experienced on the assets, which has continued to be impacted by the significant 2008 market decline. On the liability side, there have been both gains and losses in the past four years. The alternative assumptions and methods presented in this report address a specific variance between the expectations of results and actual past experience.

The alternative assumptions presented are supported by the aggregate experience gains and losses that occurred during the four year period shown in the following table, which demonstrates losses on the asset side and gains and losses on the liability side for each of the past four years with net losses in the aggregate for each of the years covered in the study. The losses on the assets side are reflective of the slow recognition of the 2008 market losses.

Year End	Liability	Asset	Aggregate
June 30	Gain/(Loss)	Gain/(Loss)	Gain/(Loss)
	(\$ millions)	(\$ millions)	(\$ millions)
2011	\$ 13.3	\$ (37.8)	\$ (24.5)
2012	(3.0)	(49.1)	(52.1)
2013	7.0	(40.1)	(33.1)
2014	(14.0)	(10.3)	(24.3)
Total	\$ 3.3	\$ (137.3)	\$ (134.0)

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

**SECTION I
BOARD SUMMARY**

Demographic Assumptions

The following table shows the liabilities losses by source as presented in the respective valuation reports.

Liability Gain/(Loss)	2011	2012	2013	2014	Total
Age and Service Retirements	\$ (9,939,721)	\$ (3,885,183)	\$ (6,585,053)	\$ 963,930	\$ (19,446,027)
Disability Retirements	(6,647,043)	(3,942,459)	(1,689,395)	(4,668,904)	(16,947,801)
Death in Service Benefits	(3,001,208)	(2,907,223)	(3,095,908)	(3,591,175)	(12,595,514)
Withdrawal from Employment	2,992,364	(2,806,133)	(2,795,786)	(7,667,343)	(10,276,898)
Pay Increases	20,996,088	11,617,298	18,090,584	5,589,217	56,293,187
Death after Retirement	8,631,152	1,350,246	3,619,987	3,717,110	17,318,495
New Entrants	(4,431,250)	(4,455,648)	(2,011,170)	(8,231,690)	(19,129,758)
Other	4,722,567	2,069,894	1,419,950	(67,599)	8,144,812
Total Actuarial Liability	\$ 13,322,949	\$ (2,959,208)	\$ 6,953,209	\$ (13,956,454)	\$ 3,360,496

During the four years of the study, the net gain/loss on liabilities relative to our assumptions was approximately \$3.36 million which would be considered immaterial to the aggregate liability during this period. However, if we examine gains/losses by assumption, it is clear that there are specific assumptions which produce consistent gains or losses. For example, there have been consistent gains on salary increases which means participants are receiving a smaller increase than anticipated under our assumptions each year. Similarly, we see consistent losses on in-service deaths which indicate that we are expecting more deaths than actual. While in aggregate the annual gains and losses from the demographic assumptions are immaterial, we believe several of these assumptions could be revised to reduce the consistent gains and losses on the individual sources.

In summary, the results of this study lead us to present the following demographic assumption changes:

1. Given the lower than expected retirements, we present an alternative set of retirement assumptions to capture the recurring loss which better reflects the patterns seen during the study period. This involves a general reduction in all assumed retirements regardless of years of service.
2. Change the current withdrawal rates for service larger than one to reflect the larger than expected withdrawals for service at or below seven years and smaller than expected withdrawals for service greater than seven years.
3. Change to disability rates to reflect smaller than expected disabilities among active participants.

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BOARD SUMMARY

4. Change the current mortality rates from the 1994 Uninsured Pensioners Generational Mortality Table to the Retired Pensioners 2000 (RP 2000) Combined Healthy mortality table as published by the Society of Actuaries with variations on projection years using Scale AA and set forwards.
5. Add an assumption for future new entrants in the System who may have previous years of service restored or transferred into the System. We propose adding a load of 0.5% of liabilities for active participants to account for this.

The net financial implications of the presented demographic assumption changes based on the June 30, 2014 valuation are an increase of the System costs from 21.67% to 22.48% as a percent of pay, an increase of 0.80%, and an increase in actuarial liabilities resulting in a decrease of the funded status from 69.7% to 69.2%, a decrease of 0.5%.

The current and alternative assumptions can be found in Appendices A and B.

Economic Assumptions

Since the last experience study, the markets continue to demonstrate a heightened degree of volatility with interest rates and inflation rates continuing to be at historic lows. The underlying inflation assumption of 2.75% influences the direction of a number of different assumptions and benefit provisions. These include the salary growth rate or salary scale, and the long-term investment assumptions and discount rate.

Currently investment and administration expenses are covered by investment returns. We are suggesting adding an administrative expenses assumption, based on the previous year's actual expenses rounded up to the next whole hundred thousand value be explicitly included in the annual normal cost instead of charging them against the net investment gain or loss. Based on the 2014 administrative expenses this would at \$3.8 million to the total cost.

Because inflation has remained low and long-term bond rates are relatively flat signaling the market expectation that inflation may stay low, we suggest the Board consider the implications of a 0.10% reduction in inflation and a 0.25% reduction in the regular interest rates and salary growth rate. Listed below are a summary of the assumptions that would be impacted.

Description	Current Assumption	Alternative Assumption
Inflation	2.75%	2.65%
Regular Interest Rate Pre Retirement	7.75%	7.50%
Regular Interest Rate Post Retirement	6.55%	6.30%
Salary Growth Rate	4.00%	3.75%

Application of these changes on top of the demographic changes listed above would further increase the System costs from 22.48% to 24.32% or an additional 1.84%. The impact on the

**SECTION I
BOARD SUMMARY**

liabilities would be such that the funded ratio would decline from 69.2% after the demographic changes, to 67.9% or an additional decrease of 1.3%.

Because the *Regular Interest Rates* are defined in the City Code, changing the Regular Interest Rate assumptions will require legislative action.

Aggregate Assumption Change Implications

In aggregate the changes in demographic and economic assumptions would result in a 2.6% increase in the System's cost as a percent of covered payroll. If applied to the 2014 valuation results, the funded ratio resulting from these changes would decrease by a net 1.8%.

The balance of this report presents the rationale for these alternative assumptions. In Section II, we present comments and exhibits supporting the alternative assumptions with respect to the demographic assumptions. In Section III, we present comments and exhibits supporting the various changes to the economic assumptions.

SECTION II DEMOGRAPHIC ASSUMPTIONS

In this section, we summarize the key findings of our demographic experience review of the System, provide alternatives for consideration, and present several graphs and tables comparing current assumptions, actual experience and alternative assumptions.

As discussed in the Board Summary, the “demographic” actuarial assumptions include the following:

1. Retirement Rates
2. Rates of Termination of Employment (Other than Death, Disability, or Retirement)
3. Disability Rates
4. Mortality Rates (Active, Retired Healthy, and Retired Disabled)
5. New Entrant assumption

To study the “rates of decrement” (i.e., retirement, termination, death, and disability), we calculate the expected number of participants whose status is expected to change using our actuarial assumptions and measure these against the appropriate actual participant population. For example, if there are 1,000 40-year olds during the study period and we expect one-half of one percent of them to become disabled, we would anticipate five disabilities. We then look at how many 40 year old lives became disabled.

To test the validity of our assumptions, we calculate the ratio of actual decrements to those expected. If the ratio is less than one, the assumed rate is too high. For example, two actual disabilities versus five expected disabilities produces a ratio of 0.4 implying rates can be reduced.

The study of decrements was based on the four year period from July 1, 2010 through June 30, 2014.

In the following sections, we discuss the results of our study of demographic experience, explain any limitations in the study procedures, and provide alternatives for the Board’s consideration.

The tables and graphs in each section compare three items:

1. the number of people eligible to have the occurrence (such as retirement),
2. the number of people expected to have the occurrence (such as retire) based on the current assumptions (illustrated in red), and,
3. the number of people expected to have the occurrence based on the alternative assumptions (illustrated in green)
4. The “actual to expected” ratios for items 2 and 3.

The alternative assumptions bring the ratios closer to one, which means the number of people we expect for an occurrence under the alternative assumptions is closer to the actual number of people who had the occurrence. By using color shading of the ratio values, we illustrate when the ratios vary from 100%. The darkest cells illustrate when the ratios are greater from 100% for the assumptions. The lightest cells illustrate when the ratios are less than 100%.

SECTION II DEMOGRAPHIC ASSUMPTIONS

In addition to reviewing the ratios of actual versus expected, the credibility of the data at each study period is also reviewed. When we refer to credibility we are measuring if there is enough data available to be able to judge if there is truly a change in the experience to consider a change or if there is insufficient data to conclude anything. The credibility of the data is illustrated by the *confidence interval* (See description below) at each study period. The wider the confidence interval is, then the greater the variability of the data and the less credible is the analysis due to fewer participants exposed to the event being analyzed. The narrower the confidence interval, the more credible is the analysis due to more participants exposed to the event being analyzed.

Confidence intervals – in any trend statistical analysis the question has to be considered is the experience sufficient to believe a true change is occurring over what was expected in the past. For example if you flipped a coin twice and both times it came up heads is that sufficient information to conclude both sides of the coin are heads. If you flipped it 100 times and they all came up heads you would have more confidence in believing both sides of the coin had heads on it. The more incidences that occur at any date point like an age, the greater the confidence that the experience is real and will continue to occur at the rate being observed. So we give more credence to high confidence intervals. The narrower the band shown in the graphs then the tighter the expectations and more reliable the data. The graphs within this study show 90% confidence intervals (grey bars). This implies a range where 90% of the time the actual experience is expected to fall within this range.

In addition, we aggregate participants for the demographic assumption review when the data at individual ages is no longer credible. For example, for the retirement assumption review, participants over age 70 are aggregated because analyzing the retirement trends for active participants 70 and older at each age would not provide credible data. By aggregating the data at 70+, there are more participants in this group which creates a smaller confidence interval.

Typically, we would like the assumptions to fall within the confidence interval, especially if this confidence interval is narrow. At the same time, it is important not to change an assumption too much from the previous assumption because anomalies in the data that occurred for one or two years could skew the results. Therefore, suggested alternative assumptions are updated by reviewing the prior assumptions and the current confidence intervals as well as participant behavior that is believed to be inconsistent with the past and future behavior due to external factors at the time.

When applying the assumptions to the data at the end points (for example, age 70+ for retirement assumption review), the current assumptions and alternative assumptions will often fall outside the confidence interval. This is to be expected due to the aggregation of the data at these points and is the one exception to the general goal of choosing assumptions that will be within the confidence interval.

SECTION II DEMOGRAPHIC ASSUMPTIONS

1. Retirement Rates

A. Current Assumptions

Normal Retirement assumptions for the System start at the later of age 60 and eligibility for Normal Retirement (earlier of age 65 with five years of service or 30 years of service).

The Early Retirement assumptions are defined for retirement prior to age 60 provided a participant meets one of the two Normal Retirement eligibility requirements (earlier of age 65 with five years of service or 30 years of service).

Once a member reaches age 70, we assume 100% probability of retirement.

B. Experience

The current assumptions vary based on age and service. Overall, the actual retirements during the study period were lower than expected (see the Results section outlined in item D below). The experience shows lower ratios of actual to expected retirements at most ages regardless of service.

C. Alternative

We propose modifying the rates for most ages. The alternative retirement rates are provided in the next section.

D. Results

The following tables and graphs compare three items; the number of people eligible for retirement, the number of people expected to retire based on the current assumptions, and the number of people expected to retire based on the alternative assumptions. They also illustrate how decreasing the retirement assumptions for all participants the assumptions are more in-line with the confidence intervals. For participant retirements above or below 30 years of service, the confidence intervals are relatively narrow at most ages.

The current assumption is separated into those who have less than 30 years of service, those with 30 years of service and those with more than 30 years of service.

In general, retirements over the period of the study have been less than anticipated. We recommend a reduction in most of the retirement rate assumptions to better match expected experience with what has been observed. However, we recognize that retirements during the period of this study continued to be impacted by the market downturn in 2008 and 2009 and have taken this into consideration in the development of our proposed retirement rate assumptions.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

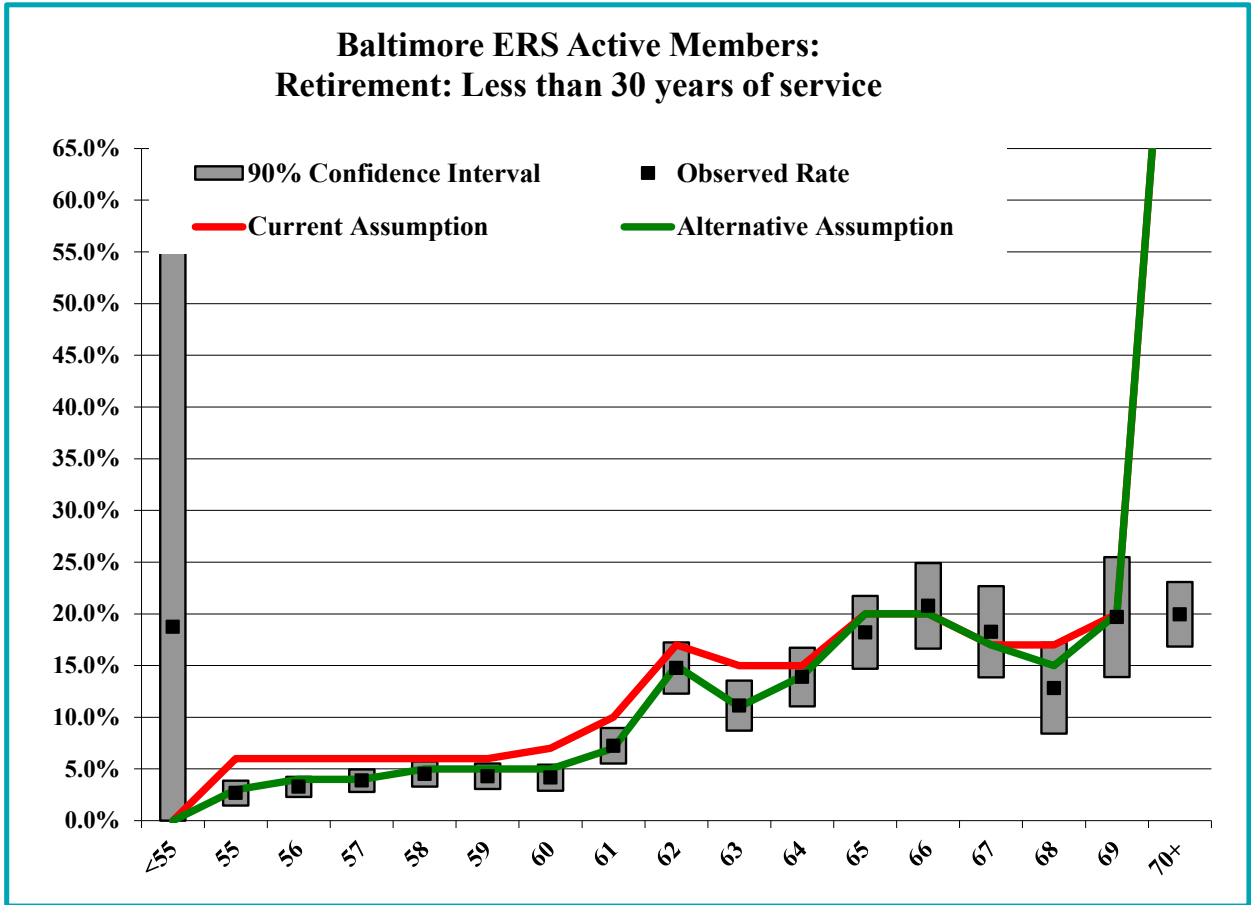
SECTION II
DEMOGRAPHIC ASSUMPTIONS

In addition, over the four year period of this study there continue to be a number of job removal programs which provide for immediate retirement. This provision allows for retirement on an unreduced basis prior to age 55 and has been a source of experience losses. Since these retirements cannot be assumed based on eligibility, we suggest continuing to assume a load of 1.75% on the active retirement liability.

Table II - 1
Baltimore ERS Active Members
Retirement: Less than 30 years of service

Age	Exposed	Total Actual Retirements	Expected Retirements	Alternative Retirements	Actual Rates	Expected Rates	Alternative Rates	Ratio: Actual over Expected	Ratio: Actual over Alternative
<55	16	3	0	0.0	18.8%	0.0%	0.0%	0%	0%
55	486	13	29	14.6	2.7%	6.0%	3.0%	45%	89%
56	918	30	55	36.7	3.3%	6.0%	4.0%	55%	82%
57	852	33	51	34.1	3.9%	6.0%	4.0%	65%	97%
58	775	35	47	38.8	4.5%	6.0%	5.0%	74%	90%
59	722	31	43	36.1	4.3%	6.0%	5.0%	72%	86%
60	673	28	47	33.7	4.2%	7.0%	5.0%	60%	83%
61	621	45	62	43.5	7.2%	10.0%	7.0%	73%	104%
62	555	82	94	83	14.8%	17.0%	15.0%	87%	98%
63	458	51	69	50	11.1%	15.0%	11.0%	74%	101%
64	403	56	60	56	13.9%	15.0%	14.0%	93%	99%
65	324	59	65	65	18.2%	20.0%	20.0%	91%	91%
66	260	54	52	52	20.8%	20.0%	20.0%	104%	104%
67	208	38	35	35	18.3%	17.0%	17.0%	109%	107%
68	156	20	27	23	12.8%	17.0%	15.0%	74%	85%
69	127	25	25	25	19.7%	20.0%	20.0%	100%	98%
70+	446	89	446	446	20.0%	100.0%	100.0%	20%	20%
Total	8,000	692	1,207	1,074	8.7%	15.1%	13.4%	57%	64%

**SECTION II
DEMOGRAPHIC ASSUMPTIONS**



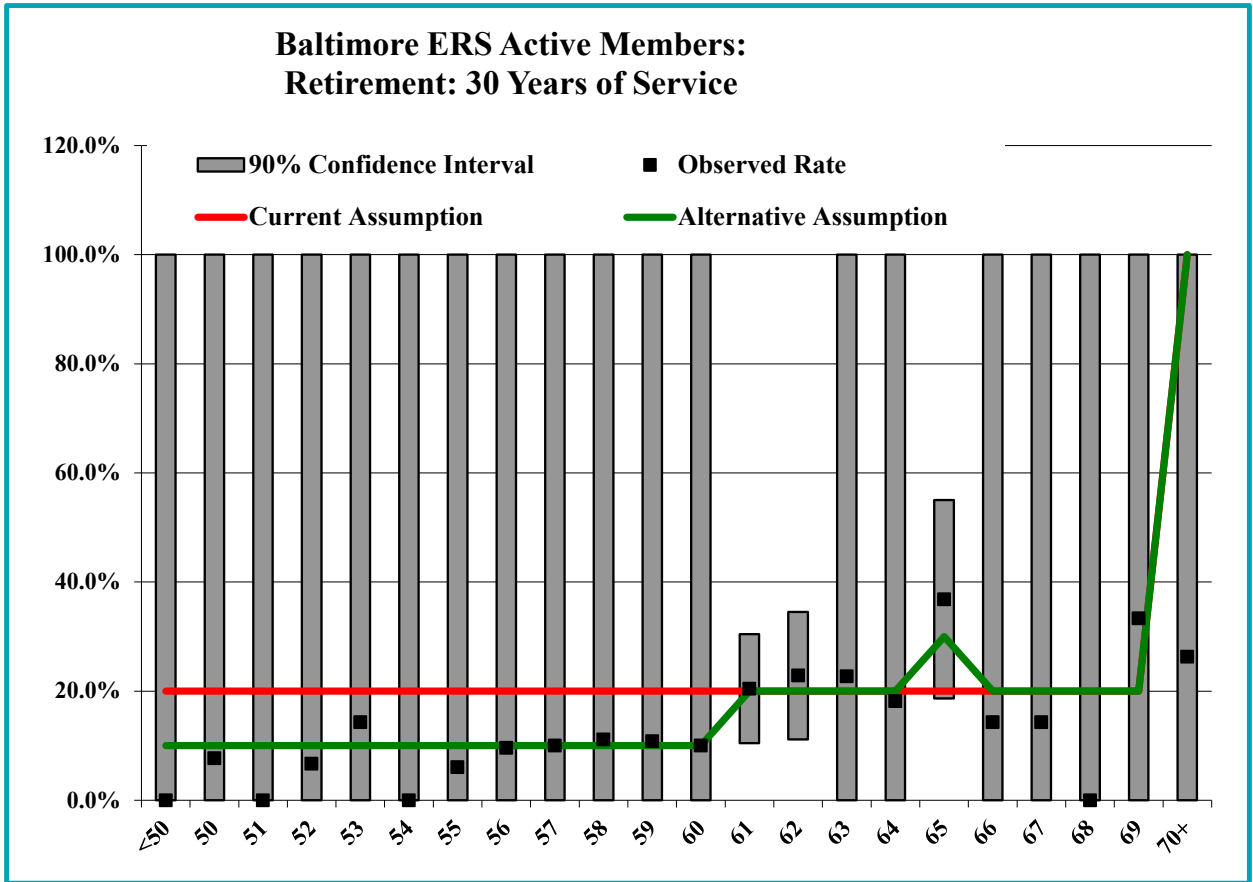
EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Table II - 2
Baltimore ERS Active Members
Retirement: 30 years of service

Age	Exposed	Total Actual Retirements	Expected Retirements	Alternative Retirements	Actual Rates	Expected Rates	Alternative Rates	Ratio: Actual over Expected	Ratio: Actual over Alternative
<50	0	0	0	0.0	0.0%	20.0%	10.0%	0%	0%
50	13	1	3	1.3	7.7%	20.0%	10.0%	33%	77%
51	16	0	3	1.6	0.0%	20.0%	10.0%	0%	0%
52	15	1	3	1.5	6.7%	20.0%	10.0%	33%	67%
53	21	3	4	2.1	14.3%	20.0%	10.0%	75%	143%
54	34	0	7	3.4	0.0%	20.0%	10.0%	0%	0%
55	33	2	7	3.3	6.1%	20.0%	10.0%	29%	61%
56	52	5	10	5.2	9.6%	20.0%	10.0%	50%	96%
57	40	4	8	4.0	10.0%	20.0%	10.0%	50%	100%
58	45	5	9	4.5	11.1%	20.0%	10.0%	56%	111%
59	37	4	7	3.7	10.8%	20.0%	10.0%	57%	108%
60	40	4	8	4.0	10.0%	20.0%	10.0%	50%	100%
61	44	9	9	8.8	20.5%	20.0%	20.0%	100%	102%
62	35	8	7	7	22.9%	20.0%	20.0%	114%	114%
63	22	5	4	4	22.7%	20.0%	20.0%	125%	114%
64	11	2	2	2	18.2%	20.0%	20.0%	100%	91%
65	19	7	4	6	36.8%	20.0%	30.0%	175%	123%
66	7	1	1	1	14.3%	20.0%	20.0%	100%	71%
67	7	1	1	1	14.3%	20.0%	20.0%	100%	71%
68	3	0	1	1	0.0%	20.0%	20.0%	0%	0%
69	3	1	1	1	33.3%	20.0%	20.0%	100%	167%
70+	19	5	19	19	26.3%	100.0%	100.0%	26%	26%
Total	516	68	118	86	13.2%	22.9%	16.6%	58%	79%

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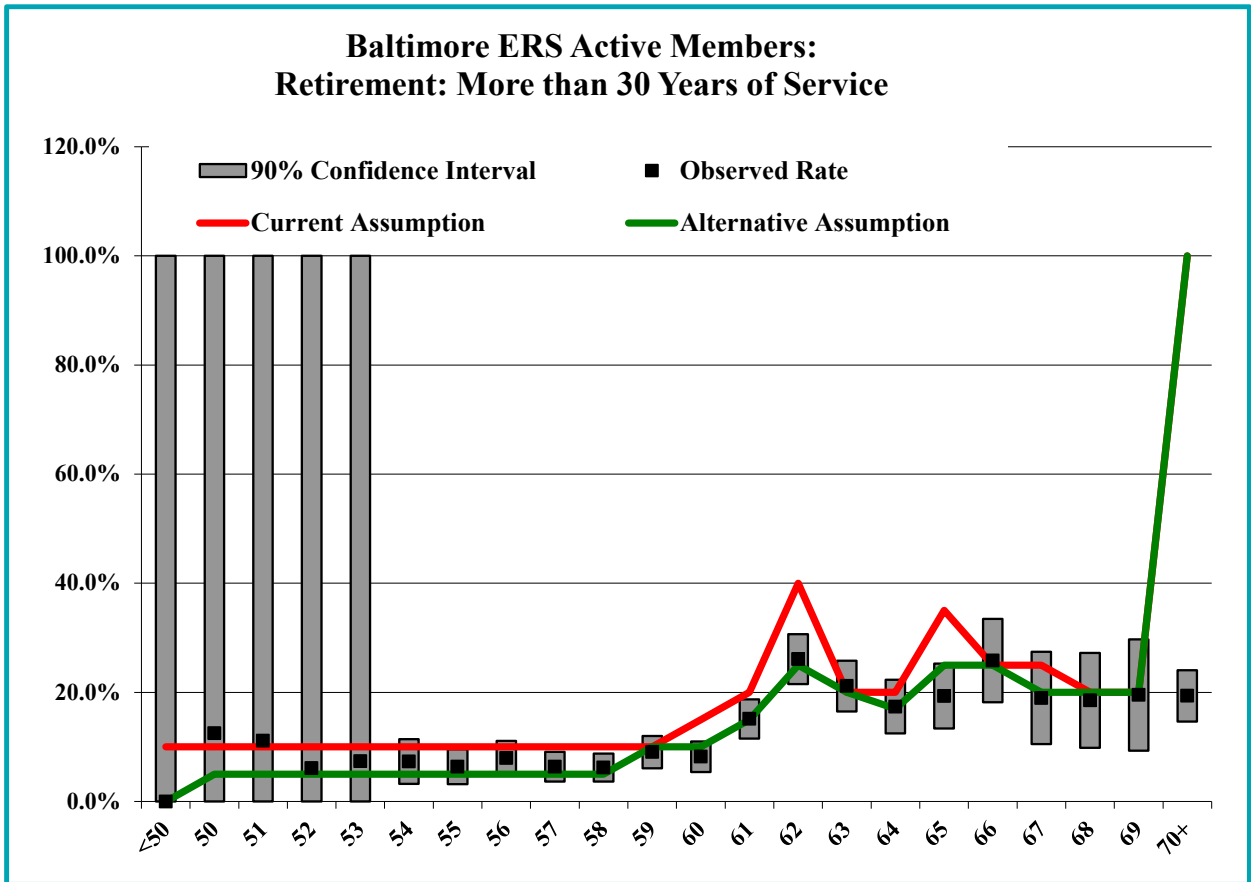
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Table II - 3
Baltimore ERS Active Members
Retirement: More than 30 years of service

Age	Exposed	Total Actual Retirements	Expected Retirements	Alternative Retirements	Actual Rates	Expected Rates	Alternative Rates	Ratio: Actual over Expected	Ratio: Actual over Alternative
<50	0	0	0	0	0.0%	10.0%	0.0%	0%	0%
50	8	1	1	0	12.5%	10.0%	5.0%	100%	250%
51	27	3	3	1	11.1%	10.0%	5.0%	100%	222%
52	49	3	5	2	6.1%	10.0%	5.0%	60%	122%
53	68	5	7	3	7.4%	10.0%	5.0%	71%	147%
54	109	8	11	5	7.3%	10.0%	5.0%	73%	147%
55	157	10	16	8	6.4%	10.0%	5.0%	63%	127%
56	201	16	20	10	8.0%	10.0%	5.0%	80%	159%
57	220	14	22	11	6.4%	10.0%	5.0%	64%	127%
58	241	15	24	12	6.2%	10.0%	5.0%	63%	124%
59	254	23	25	25	9.1%	10.0%	10.0%	92%	91%
60	256	21	38	26	8.2%	15.0%	10.0%	55%	82%
61	271	41	54	41	15.1%	20.0%	15.0%	76%	101%
62	249	65	100	62	26.1%	40.0%	25.0%	65%	104%
63	208	44	42	42	21.2%	20.0%	20.0%	105%	106%
64	161	28	32	27	17.4%	20.0%	17.0%	88%	102%
65	119	23	42	30	19.3%	35.0%	25.0%	55%	77%
66	89	23	22	22	25.8%	25.0%	25.0%	105%	103%
67	58	11	15	12	19.0%	25.0%	20.0%	73%	95%
68	54	10	11	11	18.5%	20.0%	20.0%	91%	93%
69	41	8	8	8	19.5%	20.0%	20.0%	100%	98%
70+	191	37	191	191	19.4%	100.0%	100.0%	19%	19%
Total	3,031	409	689	550	13.5%	22.7%	18.2%	59%	74%

**SECTION II
DEMOGRAPHIC ASSUMPTIONS**



The current and proposed assumptions are summarized in Appendix A and B, respectively.

2. Rates of Termination of Employment

A. Current Assumptions

The current termination assumptions are based on service with lower rates of turnover the longer a participant has been employed with the City.

B. Experience

Overall, the actual terminations appear higher than expected for participants with less than 7 years of service but lower than expected as service increases.

C. Alternative

We propose slight modifications to the rates. The alternative termination rates are provided in the next section.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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D. Results

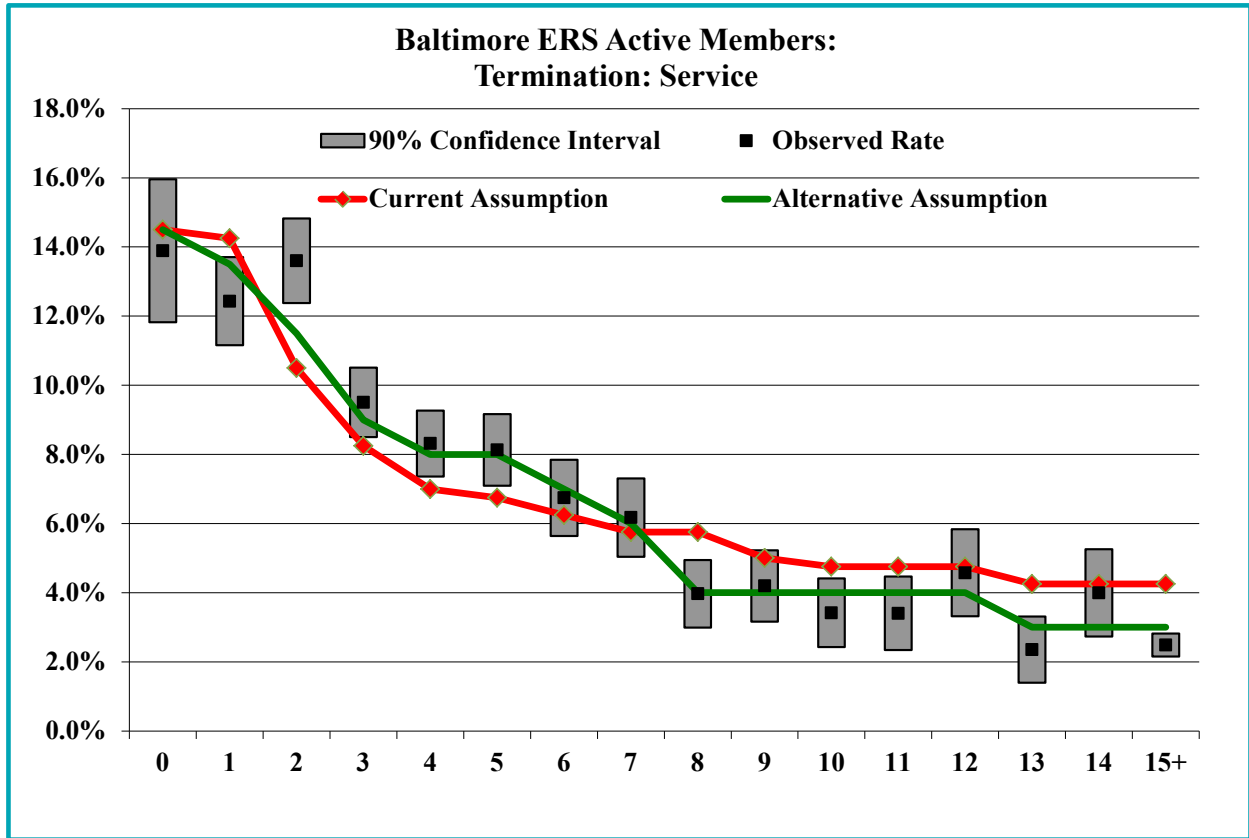
The following tables and graphs compare three items; the number of people eligible for the termination decrement, the number of people expected to terminate based on the current assumptions, and the number of people expected to terminate based on the alternative assumptions.

The alternative assumptions bring the rates either within the confidence intervals or closer to the confidence intervals on the graph.

Table II - 4
Baltimore ERS Active Members
Termination: By Years of Service

Service	Exposed	Total Actual Terminations	Expected Terminations	Alternative Terminations	Actual Rates	Expected Rates	Alternative Rates	Ratio: Actual over Expected	Ratio: Actual over Alternative
0	756	105	110	110	13.89%	14.50%	14.50%	95%	96%
1	1,818	226	259	245	12.43%	14.25%	13.50%	87%	90%
2	2,125	289	223	244	13.60%	10.50%	11.50%	130%	118%
3	2,304	219	190	207	9.51%	8.25%	9.00%	115%	106%
4	2,273	189	159	182	8.32%	7.00%	8.00%	119%	104%
5	1,894	154	128	152	8.13%	6.75%	8.00%	120%	102%
6	1,394	94	87	98	6.74%	6.25%	7.00%	108%	96%
7	1,215	75	70	73	6.17%	5.75%	6.00%	107%	103%
8	1,083	43	62	43	3.97%	5.75%	4.00%	69%	99%
9	1,025	43	51	41	4.20%	5.00%	4.00%	84%	105%
10	907	31	43	36	3.42%	4.75%	4.00%	72%	85%
11	793	27	38	32	3.40%	4.75%	4.00%	71%	85%
12	743	34	35	30	4.58%	4.75%	4.00%	97%	114%
13	680	16	29	20	2.35%	4.25%	3.00%	55%	78%
14	651	26	28	20	3.99%	4.25%	3.00%	93%	133%
15+	5,944	148	253	178	2.49%	4.25%	3.00%	58%	83%
Total	25,605	1,719	1,765	1,711	6.71%	6.89%	6.68%	97%	100%

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3. Disability Rates

A. Current Assumptions

The current disability assumptions vary by age with higher expected incidence of disability the older the participant.

B. Experience

Overall, the actual number of participants becoming disabled was lower than expected.

C. Alternative

We propose reducing the rates for older participants.

D. Results

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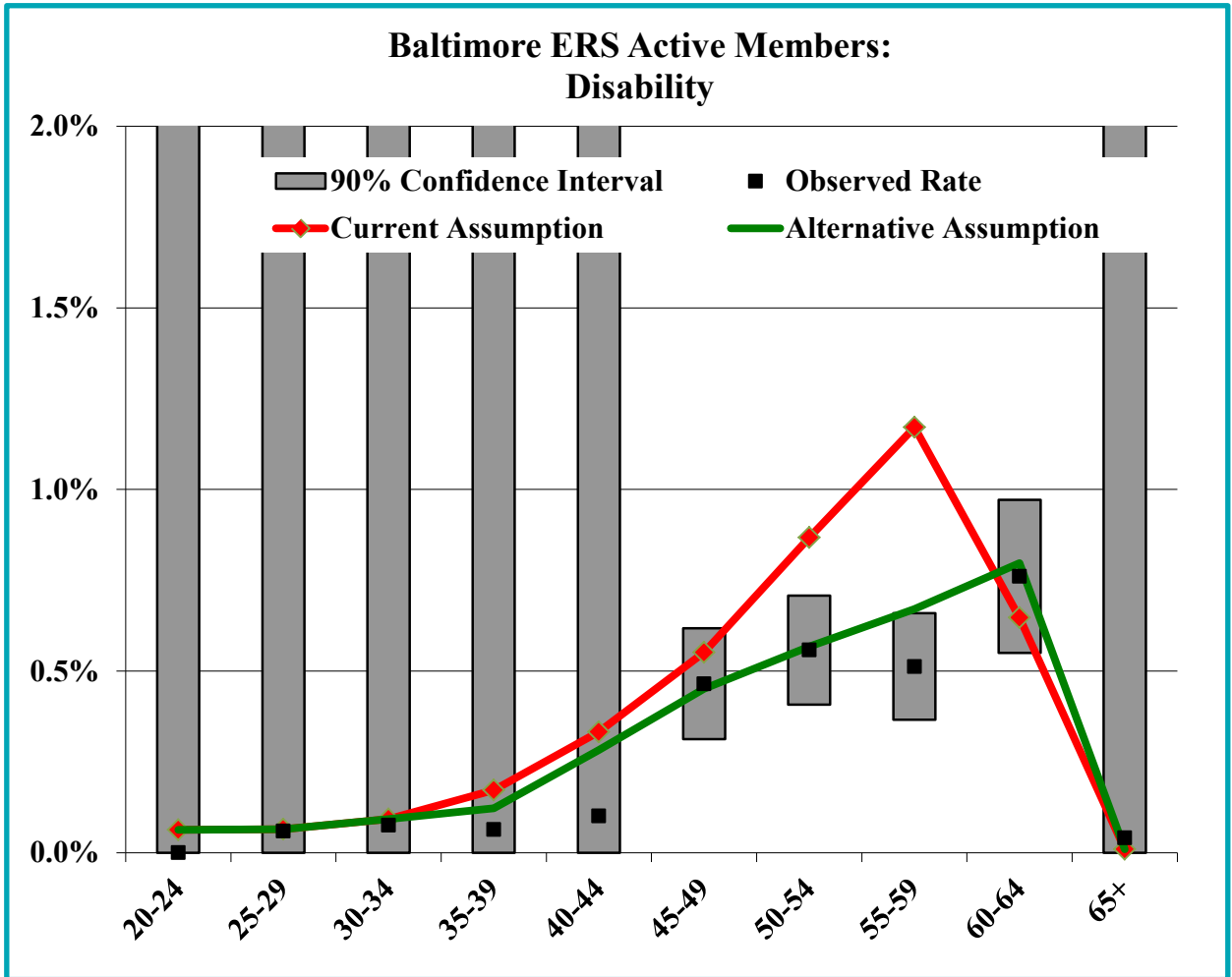
The following tables and graphs compare three items; the number of people eligible to become disabled, the number of people expected to become disabled based on the current assumptions, and the number of people expected to become disabled based on the alternative assumptions. The alternative assumptions bring the ratios closer to one, which implies the number of people we expect to become disabled is closer to the actual number of people who were disabled. The alternative assumptions bring the rates within the confidence intervals where we have credible amounts of data on the graph. The data is not credible at the younger ages as illustrated by the wider confidence intervals.

We are not proposing any changes to the form of payment elected by disabled retirees at this time. The current assumptions are summarized in Appendix A.

Table II - 5
Baltimore ERS Active Members
Disability

Age	Exposed	Total Actual Disabilities	Expected Disabilities	Alternative Disabilities	Actual Rates	Expected Rates	Alternative Rates	Ratio: Actual over Expected	Ratio: Actual over Alternative
<20	-	0	0	0	0.00%	0.00%	0.00%	0%	0%
20-24	265	0	0	0	0.00%	0.06%	0.06%	0%	0%
25-29	1,685	1	1	1	0.06%	0.06%	0.06%	100%	92%
30-34	2,650	2	2	2	0.08%	0.09%	0.09%	100%	82%
35-39	3,146	2	5	4	0.06%	0.17%	0.12%	40%	52%
40-44	3,941	4	13	11	0.10%	0.33%	0.28%	31%	36%
45-49	5,376	25	30	24	0.47%	0.55%	0.45%	83%	103%
50-54	6,633	37	58	38	0.56%	0.87%	0.57%	64%	98%
55-59	6,435	33	75	43	0.51%	1.17%	0.67%	44%	76%
60-64	4,602	35	30	37	0.76%	0.65%	0.80%	117%	95%
65+	2,419	1	0	0	0.04%	0.01%	0.01%	0%	428%
Total	37,152	140	214	161	0.38%	0.58%	0.43%	65%	87%

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SECTION II
DEMOGRAPHIC ASSUMPTIONS

4. Mortality Rates

A. Current Assumptions

Active Lives

For non-line-of-duty mortality the 1994 Uninsured Pensioners Generational Mortality table (Male + 4, Female + 1) with generational projections using 50% of the AA scale projected to 2016 was previously used. For line-of-duty mortality 0.005% mortality was assumed at all ages.

Retired Healthy Lives

The 1994 Uninsured Pensioners Generational Mortality table (Male + 4, Female + 1) with generational projections using 50% of the AA scale projected to 2016 was used.

Retired Disabled Lives

See sample rates below

Age	Disabled Members	
	Male	Female
55	0.05392	0.02529
60	0.06435	0.03138
65	0.07679	0.04088
70	0.09558	0.05568
75	0.12298	0.07841
80	0.16115	0.11274

B. Experience

Active Lives

Deaths among active lives is typically too small of a group and may not provide meaningful statistics on pre-retirement mortality in a four-year period. We have combined the terminated vested group of participants with the actives to provide a larger sampling of data. Together, there were about 41,400 exposures in total which provides a large enough sampling to analyze this group. The actual mortality rates were not much less than the expected rates.

Retired Healthy Lives

For mortality for retirees and beneficiaries we have about 31,000 exposures to compare actual versus expected experience. The tables in the next section show actual and expected

SECTION II DEMOGRAPHIC ASSUMPTIONS

experience among members for retirees and beneficiaries combined. The actual mortality among retirees and beneficiaries were slightly higher than expected.

Retired Disabled Lives

Mortality for disabled lives gives us an even smaller group to analyze actual versus expected experience. However, based upon the data, the actual mortality among disabled lives was higher than expected.

C. Alternatives

In general, we recommend updating from the 1994 Uninsured Pensioners Generational Mortality table to the Retired Pensioners 2000 (RP 2000) mortality table as this mortality table is based on more recent mortality experience.

Active Lives

The active mortality measurement is too small statistically to create an entirely new mortality table. However, the data is large enough to use a current mortality table and adjust accordingly to the current mortality experience. We propose the use of the standard RP 2000 Healthy mortality table as published by the Society of Actuaries projected using 50% mortality improvement scale AA for 15 years for non-line-of-duty mortality with a three year set forward for males and females. By setting forward the table three years, a participant's mortality assumption will coincide with the mortality rate of a person three years older. We recommend no change to the line-of-duty mortality rates.

Retired Healthy Lives

We propose the standard RP 2000 Healthy mortality table as published by the Society of Actuaries projected using 50% mortality improvement scale AA for 15 years with a two-year set forward for males and females. By setting forward the table two years, a participant's mortality assumption will coincide with the mortality rate of a person two years older.

Retired Disabled Lives

We recommend the RP 2000 Disabled mortality table as published by the Society of Actuaries projected using 50% mortality improvement scale AA for 15 years with a four-year set forward. By setting forward the table four years, a participant's mortality assumption will coincide with the mortality rate of a person four years older.

D. Results

The following tables and graphs compare three things; the number of people exposed to the mortality assumption, the number of people expected to die based on the current

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assumptions, and the number of people expected to die based on the alternative assumptions. As you can see, the alternative assumptions bring the ratios closer to 100% of the actual experience for the active and disabled mortality review. While there is not much variation between the current and alternative mortality tables used for retirees and beneficiaries, we still recommend updating the mortality table to the more recently published RP 2000 tables.

The current assumptions are summarized in Appendix A.

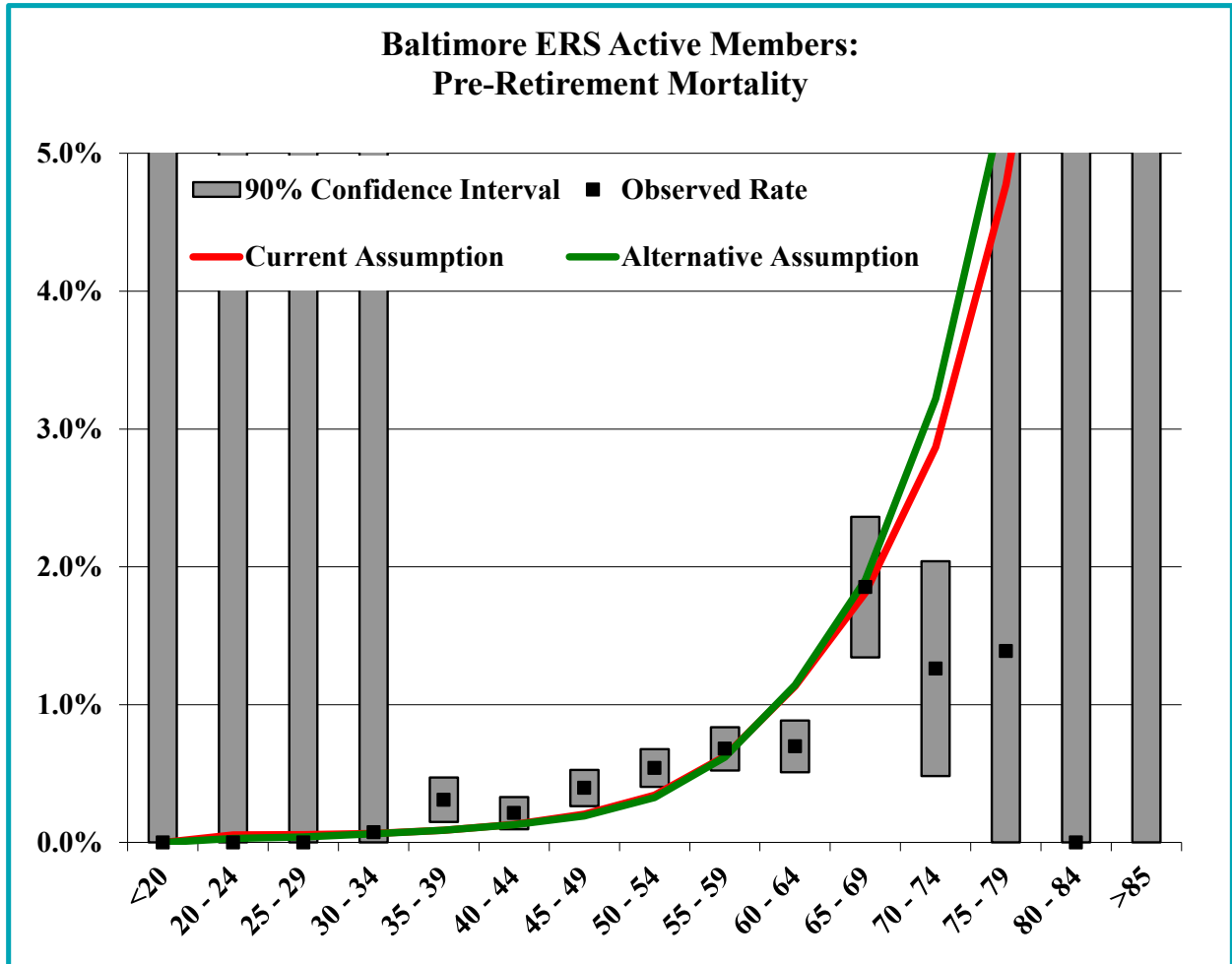
EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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Table II - 6
Baltimore ERS Active Members
Mortality for Males & Females

Age	Exposed	Total Actual Deaths	Expected Deaths	Alternative Deaths	Actual Rates	Expected Rates	Alternative Rates	Ratio: Actual over Expected	Ratio: Actual over Alternative
<20	0	0	0	0	0.000%	0.000%	0.000%	0%	0%
20 - 24	265	0	0	0	0.000%	0.055%	0.029%	0%	0%
25 - 29	1,687	0	1	1	0.000%	0.058%	0.040%	0%	0%
30 - 34	2,666	2	2	2	0.075%	0.066%	0.063%	114%	119%
35 - 39	3,228	10	3	3	0.310%	0.088%	0.089%	352%	350%
40 - 44	4,219	9	6	5	0.213%	0.132%	0.130%	162%	164%
45 - 49	6,071	24	13	12	0.395%	0.206%	0.192%	191%	206%
50 - 54	7,777	42	27	25	0.540%	0.343%	0.326%	158%	166%
55 - 59	7,505	51	47	46	0.680%	0.626%	0.619%	109%	110%
60 - 64	5,312	37	60	61	0.697%	1.135%	1.142%	61%	61%
65 - 69	1,889	35	34	36	1.853%	1.813%	1.906%	102%	97%
70 - 74	555	7	16	18	1.261%	2.869%	3.221%	44%	39%
75 - 79	216	3	10	12	1.389%	4.773%	5.437%	29%	26%
80 - 84	77	0	6	7	0.000%	7.721%	9.294%	0%	0%
>85	18	4	2	3	22.222%	13.408%	16.329%	166%	136%
Total	41,485	224	227	231	0.540%	0.546%	0.556%	99%	97%

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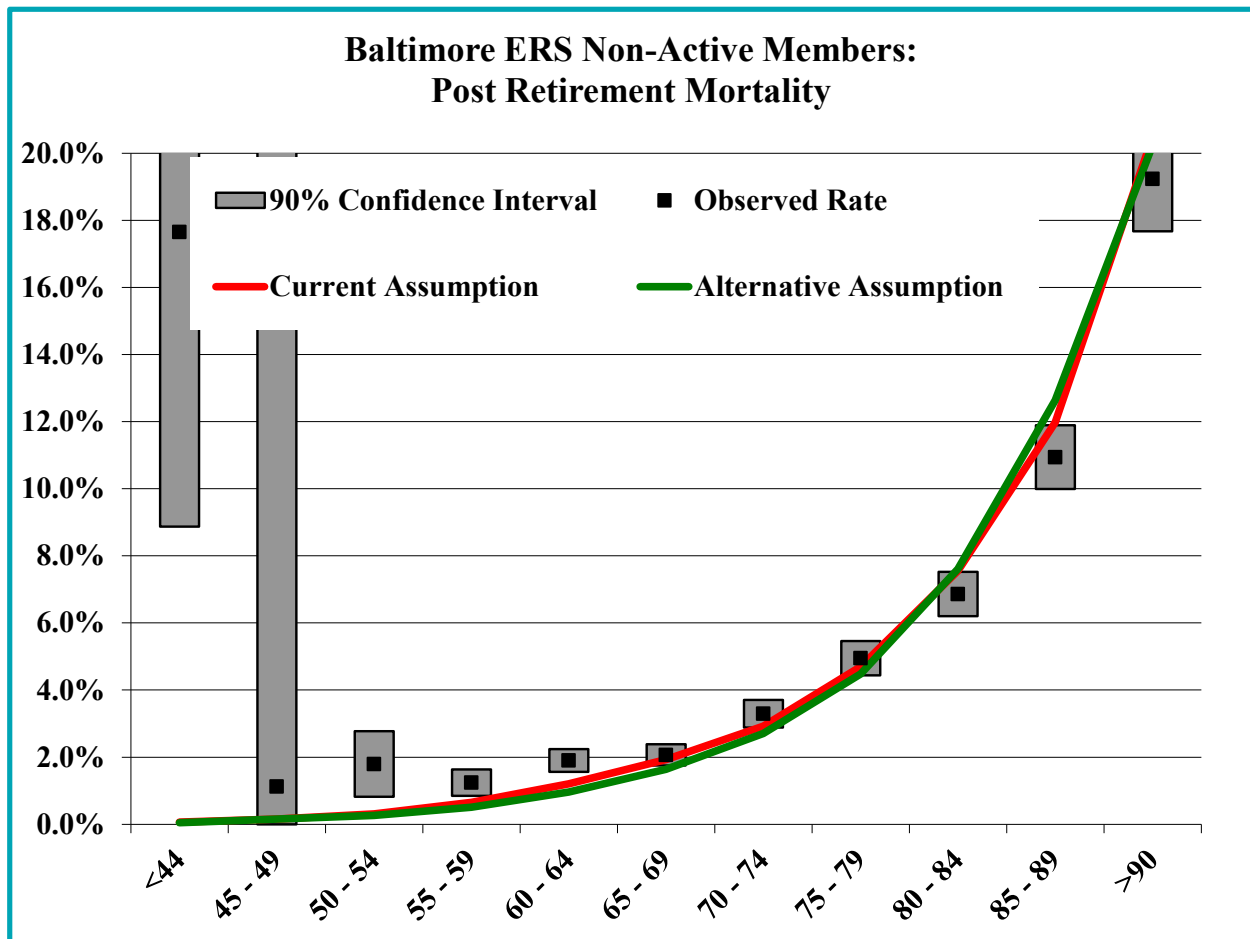


EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
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Table II - 7
Baltimore ERS Inactive Members
Retired Mortality for Males & Females

Age	Exposed	Total Actual Deaths	Expected Deaths	Alternative Deaths	Actual Rates	Expected Rates	Alternative Rates	Ratio: Actual over Expected	Ratio: Actual over Alternative
<44	51	9	0	0	17.647%	0.065%	0.045%	27219%	39483%
45 - 49	89	1	0	0	1.124%	0.158%	0.152%	712%	738%
50 - 54	501	9	2	1	1.796%	0.310%	0.262%	580%	686%
55 - 59	2,174	27	14	11	1.242%	0.653%	0.509%	190%	244%
60 - 64	4,363	83	53	42	1.902%	1.207%	0.960%	158%	198%
65 - 69	5,420	112	105	89	2.066%	1.932%	1.639%	107%	126%
70 - 74	5,160	170	151	140	3.295%	2.919%	2.706%	113%	122%
75 - 79	4,888	242	229	219	4.951%	4.694%	4.475%	105%	111%
80 - 84	3,993	274	302	304	6.862%	7.558%	7.606%	91%	90%
85 - 89	2,916	319	349	369	10.940%	11.981%	12.639%	91%	87%
>90	1,721	331	353	348	19.233%	20.491%	20.234%	94%	95%
Total	31,276	1,577	1,557	1,522	5.042%	4.979%	4.867%	101%	104%



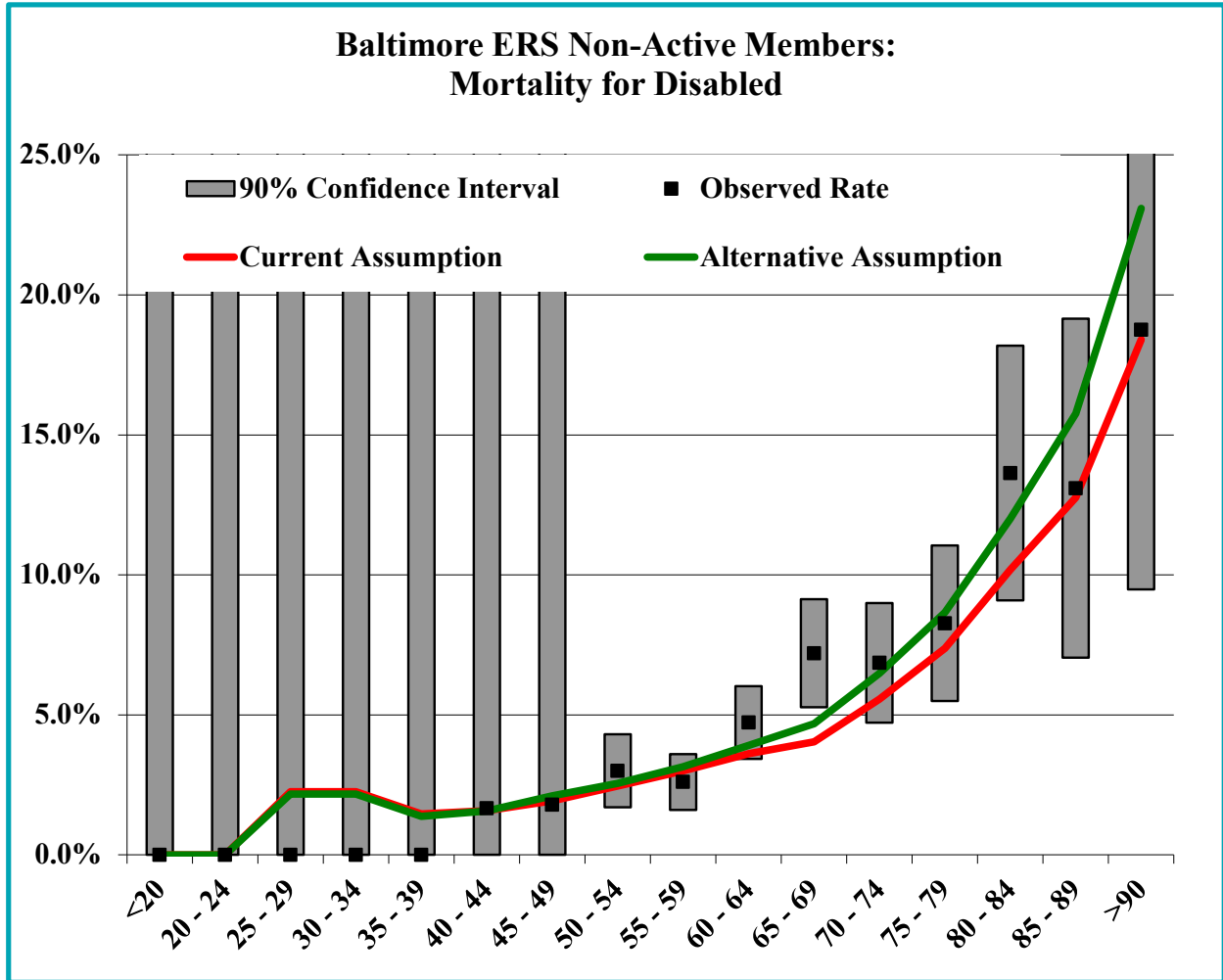
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Table II - 8
Baltimore ERS Inactive Members
Disabled Mortality for Males & Females

Age	Exposed	Total Actual Deaths	Expected Deaths	Alternative Deaths	Actual Rates	Expected Rates	Alternative Rates	Ratio: Actual over Expected	Ratio: Actual over Alternative
<20	0	0	0	0	0.0%	0.0%	0.0%	0%	0%
20 - 24	0	0	0	0	0.0%	0.0%	0.0%	0%	0%
25 - 29	2	0	0	0	0.0%	2.3%	2.2%	0%	0%
30 - 34	4	0	0	0	0.0%	2.3%	2.2%	0%	0%
35 - 39	21	0	0	0	0.0%	1.5%	1.4%	0%	0%
40 - 44	60	1	1	1	1.7%	1.6%	1.6%	106%	106%
45 - 49	168	3	3	4	1.8%	1.9%	2.1%	93%	85%
50 - 54	466	14	11	12	3.0%	2.5%	2.6%	122%	117%
55 - 59	691	18	21	22	2.6%	3.0%	3.2%	87%	83%
60 - 64	719	34	26	28	4.7%	3.6%	3.9%	131%	121%
65 - 69	486	35	20	23	7.2%	4.0%	4.7%	178%	154%
70 - 74	379	26	21	25	6.9%	5.6%	6.5%	123%	106%
75 - 79	266	22	20	23	8.3%	7.4%	8.7%	112%	95%
80 - 84	154	21	16	18	13.6%	10.2%	12.0%	134%	114%
85 - 89	84	11	11	13	13.1%	12.8%	15.8%	103%	83%
>90	48	9	9	11	18.8%	18.4%	23.1%	102%	81%
Total	3,548	194	158	180	5.5%	4.5%	5.1%	123%	108%

SECTION II
DEMOGRAPHIC ASSUMPTIONS



SECTION III ECONOMIC ASSUMPTIONS

In section III, we present information with respect to the economic assumptions including the following:

1. Inflation
2. Rate of Investment Return/Discount Rate
3. Rate of Salary Growth

All of these assumptions are interrelated with their foundation as a reflection of the underlying inflation during the period. For example, the rate of investment return may be split into two components. One is the “real rate” of return to the investor and the other compensates for inflation.

Similarly, the rate of salary growth may be separated into the inflation rate plus components for “productivity” or real wage increase and merit and seniority scale.

In developing recommendations for these assumptions, several factors are considered:

- historical data in general (i.e. the markets)
- historical experience of the plan
- outlook for the future
- assumptions used by other public sector plans

1. Inflation

A. Current Assumptions

The inflation rate is an underlying aspect of all economic assumptions. The difference between other economic assumptions relative to the long-term underlying rate of inflation is an important measure. The current rate of inflation is 2.75%.

B. Experience

1. *Historical Experience in General*

Based on the Consumer Price Index for all Urban Consumers – U.S. City Average (CPI-U), Table III-1 on the next page shows the inflation rates for the past 20 years. The current 2.75% rate of inflation exceeds the regional rate of inflation over the last five years (as shown in Table III-1) but it is generally accepted that this is a historically unusual period for this measurement.

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**SECTION III
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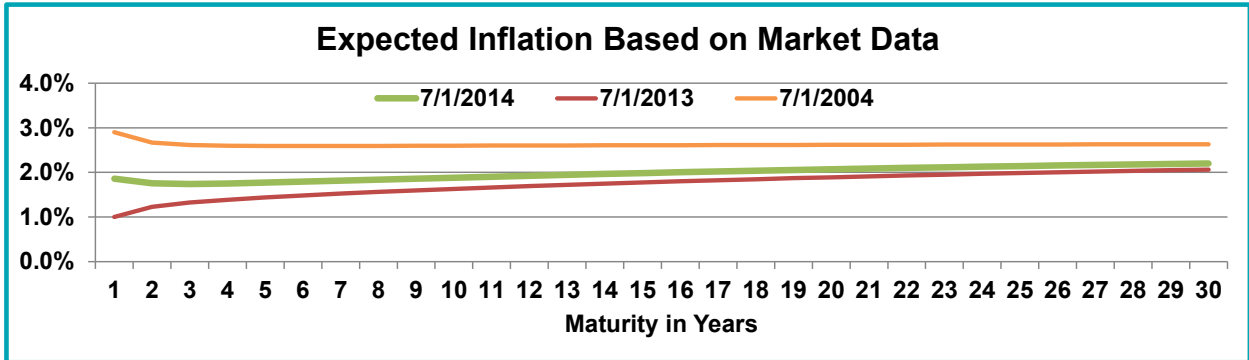
Table III-1 Urban Consumers Average (CPI-U) Year Ending June 30, Increase in CPI-U	
1995	3.04%
1996	2.75%
1997	2.30%
1998	1.68%
1999	1.96%
2000	3.73%
2001	3.25%
2002	1.07%
2003	2.11%
2004	3.27%
2005	2.53%
2006	4.32%
2007	2.69%
2008	5.02%
2009	-1.43%
2010	1.05%
2011	3.56%
2012	1.66%
2013	1.75%
2014	2.07%
1995-2014	2.41%
2005-2014	2.31%
2010-2014	2.02%

The inflation rates have declined significantly over the past 20 years, especially in the past eight years due in part to the Federal Reserve's decision to keep treasury rates low to stimulate the economy. However, there are indications that this rate will increase in the future.

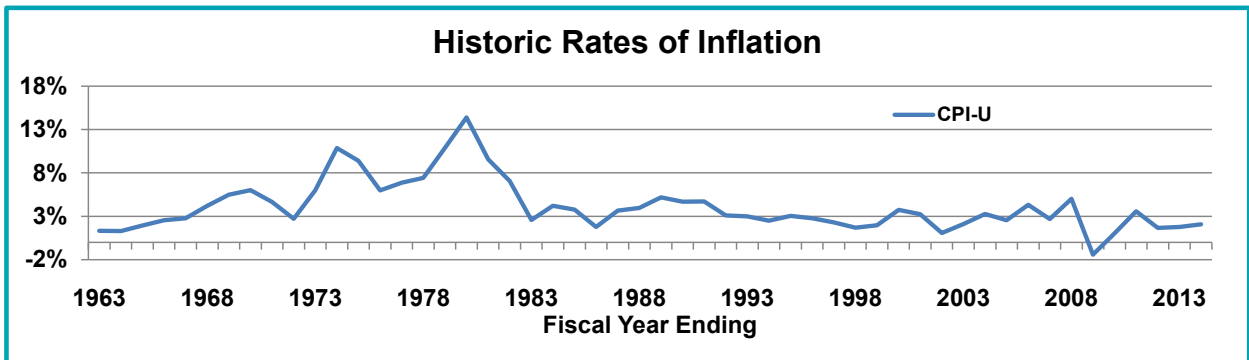
2. Market Expectations

There are some who argue the market defines the underlying inflation when considering the spread between long terms bonds and inflation protected securities like tips.

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The market data implies a lower rate, while the historic data shows much more volatility in the rates and support reducing the current assumption while remaining within the generally accepted ranges for retirement plans between 2.5% to 3.5%. This also represents the underlying long-term inflation assumption maintained by the System's investment consultant.

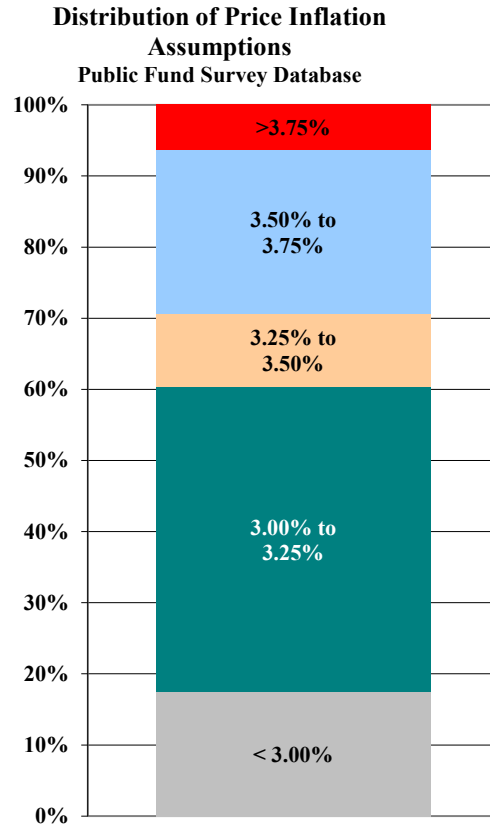


3. *Other Public Sector Plans*

Included in the National Association of State Retirement Administrators (NASRA) annual survey of public funds is data on inflation assumptions. Chart III-1 below shows the distribution of price inflation assumptions for the 126 systems in the public fund survey database.

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Chart III-1



The median assumption in the survey database is 3.00%, and in our experience, this represents a reduction in inflation assumptions over the last few years.

We recommend reduction in the inflation rate from 2.75% to 2.65% in response to the continued general trend in inflation.

2. Rate of Investment Return

A. Current Assumptions

The Retirement Systems' assets are assumed to earn 7.75% net of expenses. The investment consultants have generally trended their expectation down to a value closer to 7.00% long term. The discount rate for measuring liabilities is a liability weighted value based on the *regular interest rate* defined in the City code of 7.75% for active liability and 6.55% for liability of participants in pay status. Based on the 2014 Actuarial Valuation this liability weighted discount rate was 7.09%.

**SECTION III
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B. Experience

1. Historical Experience in General

Table III-2 provides the rates of investment returns experienced by the Retirement System during the last ten fiscal years. Rates of return were computed as the ratio of the net investment earnings to market value of asset.

Current Assumption: 7.75% per annum pre-retirement
6.55% per annum post-retirement

Table III-2 Investment Returns on Market Value of Assets	
Year Ending June 30,	Return
2005	8.80%
2006	10.60%
2007	17.20%
2008	-5.00%
2009	-19.30%
2010	11.20%
2011	19.59%
2012	1.62%
2013	12.38%
2014	15.73%
Compounded Averages up to July 1, 2014	
Last 5 Years (2010 - 2014)	11.94%
Last 10 Years (2005 - 2014)	6.63%

The investment returns on a five-year basis are higher than the current assumption while the investment returns on a ten-year basis are lower than the current assumption due to the financial market decline during 2008 and 2009. This is reflected in the difference between the five- and ten-year averages as of July 1, 2014.

However long-term investment return expectations on assets should not be the sole measure used in the determination of the value of liabilities under the Retirement System. The higher this assumption the greater the risk that the measure of liabilities could be understated and the Retirement System costs will increase in the future. Reducing the investment return/discount rate increases the liability measurement; reducing the risk of future Retirement System cost increases.

2. Outlook for the future

The first table shows expected average annual rates of return on the asset classes in which this System invests. The rates were provided to us by the investment consultant, Marquette Associates, Inc. The total rate of return includes both income (dividends and

**SECTION III
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interest) and capital appreciation. The table also shows the “real” rate of return, net of the 2.75% long-term inflation assumptions of the consultant.

Asset Class Benchmark	FYE 2014 Benchmark Mean Return	Real Rate of Return
U.S. Equity - S&P 500	7.97%	5.22%
Non U.S Equity	8.33%	5.58%
Real Estate	8.12%	5.37%
Fixed Income	2.82%	0.07%
Hedge Funds	6.00%	3.25%
Private Equity	13.10%	10.35%

Asset Class	Allocation
U.S. Equity - S&P 500	30%
Global Equity	6%
Non U.S Equity	14%
Real Estate	9%
Fixed Income	26%
Hedge Funds	5%
Private Equity	10%

The investment consultant (Marquette Associates, Inc.) has provided, that based on their projected returns by class and the asset allocation, the System’s portfolio is predicted to produce a long-term return rate of 7.13%. However, they also provide that there is a 57.8% probability that returns will be below 7.75% in any given year which is anticipated with an average. We believe that by utilizing an assumption that is below the expected return rate the Board can reduce the downside risk with the current asset allocation and/or reduce the risk within the asset allocation.

Taking into account that the System pays investment advisors to assist in developing and maintaining its portfolio includes the cost of investments. For purposes of setting the actuarial assumption for return, it is important that we take these fees into consideration and use a net return. During the study period the System has paid investment fees as follows:

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Plan Year Ending June 30,	Market Value of Assets*	Investment Expenses	Expenses as a % of MVA
2011	\$ 1,085,191,347	\$ 4,360,783	0.40%
2012	1,238,621,977	6,215,546	0.50%
2013	1,216,498,446	5,828,845	0.48%
2014	1,324,733,814	8,117,367	0.61%
Total	\$ 4,865,045,584	\$ 24,522,541	0.50%

* Asset value as of the beginning of the year

The net real rate of return assumption from this development would be around 6.61% (7.11% minus 0.5% for expenses).

The System applies rates to the valuation of liabilities that are supported by the assets. For active participants the assumption is 7.75%, and for retirees the assumption is 6.55%. The liability weighted rate of return in each of the four years measured is shown below.

	June 30,			
	2011	2012	2013	2014
Liability Weighted Return	7.12%	7.11%	7.10%	7.09%

As more and more of the liabilities of the System shift to participants in pay status, the average interest rate declines. This in turn lowers the long-term expected rate of return and allows for the target asset allocation to be adjusted to better secure funds to meet a higher proportion of benefit payments.

While the liability weighted return is below the net investment return, the opportunity to create additional margin and reduce the frequency and magnitude of future investment losses is an important consideration.

3. Other Public Sector Plans

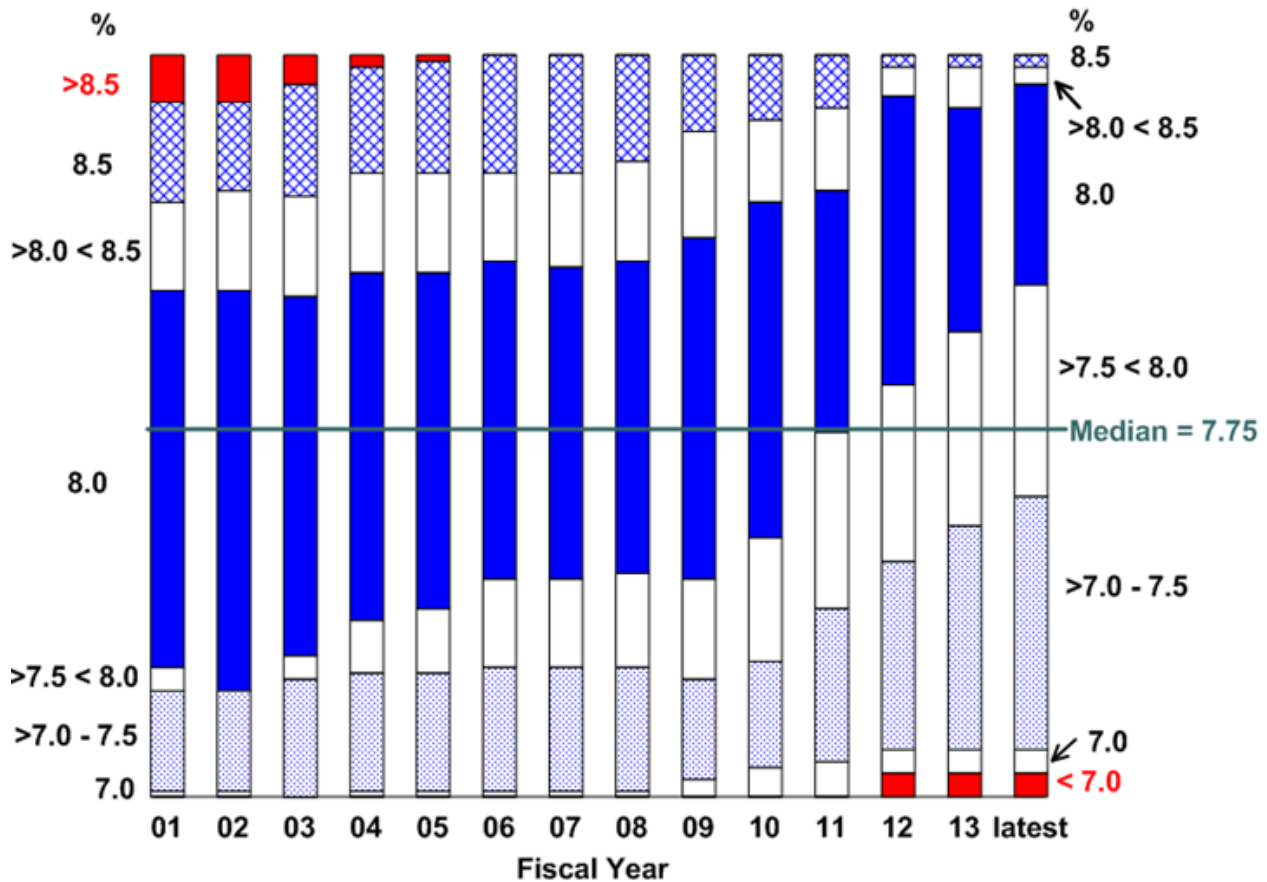
The National Association of State Retirement Administrators (NASRA) conducts an annual survey of public funds. The Public Fund Survey covers 126 large retirement systems. Chart III-2 on the following page shows the historical distribution of investment return assumptions for the last 12 years from the 2014 survey, and Chart II-3 shows the most recent information in the Public Fund Survey database.

Over the period shown in the survey, there has been a pattern of reducing investment return assumptions, first reducing the highest assumptions to below 8.5% and more recently reducing

**SECTION III
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assumptions below 8.0%. The 2012 survey was the first in which the median assumption was less than 8.0%, and the first in which a system had adopted an assumption less than 7.0%. The most recent data shows a similar pattern with a median assumption of 7.75%. The survey is consistent with our experience that there has been a significant trend to reduce the discount rate in the last four years.

Chart III- 2



C. Alternatives

Based on historical returns; both in the general markets and actual for the Retirement System, as well as other plans' assumptions, the Retirement System's current 7.75% assumption is not outside the range of acceptable investment return assumptions. Based on the Retirement System's investment return experience, this trend supports consideration to reduce the *regular interest rates* in step with the suggested change in the inflation rate by 0.25% to 7.50% and 6.30% for the investment return/discount rate assumption.

**SECTION III
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3. Salary Increase

A. Current Assumptions

The current salary increase assumption is an age-based assumption.

B. Experience

For purposes of this assumption, we have excluded 2010 compensation experience as the recession likely had an effect on salary increases during that period. The average salary increase over the testing period is 3.03%. If we compare the actual salary increases to the salary increase that we expected, we can see that the actual increase was lower. The Table III-6 on the following page shows the total salary increase rate experienced during the four-year study period.

C. Recommendations

Given that actual increases have been lower than the expected salary increase rate and salary increases are a reflection of the underlying rates of inflation and based upon the data, we recommend lowering salary increase rate assumptions to take into account for the suggested decrease in the inflation rate and to better reflect actual experience.

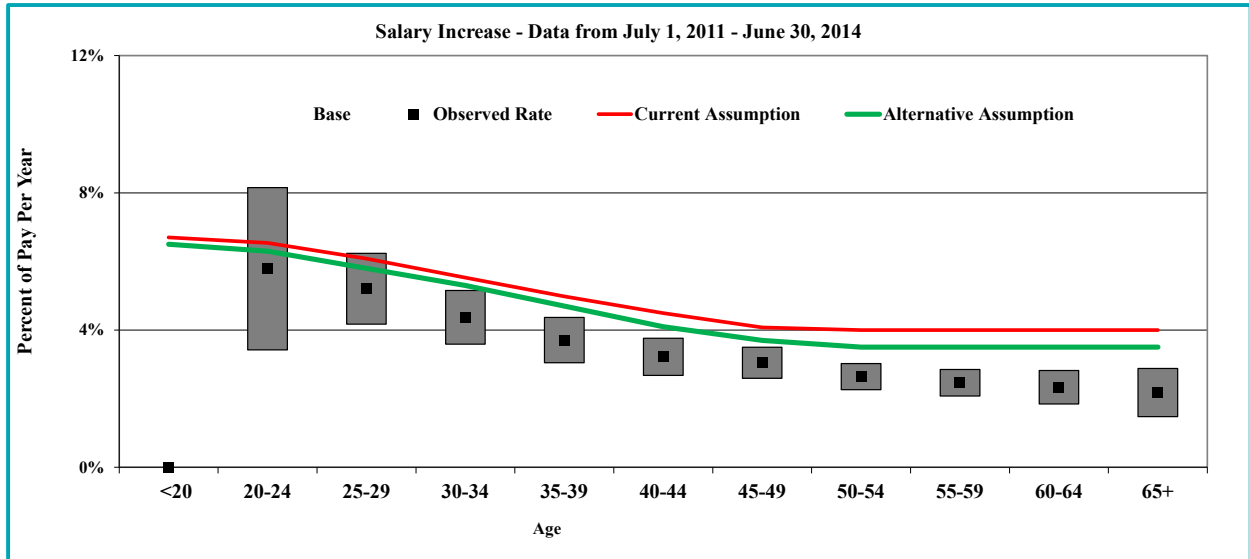
D. Results

The following Table III-6 and corresponding graph shows the age-based salary increase rate that might be applied when analyzing the data over the Fiscal Years 2011 through 2014.

The graph provides the average salary scale rate and the *confidence intervals* associated with this average rate. We have grouped the data in 5 year age groups to increase the number of exposures used in determining the confidence intervals. The wider the confidence interval is, then the greater the variability of the data for the salary increase rates.

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Age	Observed Rate	Current Rate	Alternative Rate
<20	0.00%	6.70%	6.50%
20-24	5.79%	6.54%	6.30%
25-29	5.20%	6.08%	5.80%
30-34	4.37%	5.53%	5.30%
35-39	3.71%	4.98%	4.70%
40-44	3.22%	4.50%	4.10%
45-49	3.05%	4.08%	3.70%
50-54	2.64%	4.00%	3.50%
55-59	2.46%	4.00%	3.50%
60-64	2.33%	4.00%	3.50%
65+	2.18%	4.00%	3.50%

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**SECTION IV
COST IMPACT**

In this section we illustrate the financial implication of making the alternative economic assumptions, discussed in this report, on the June 30, 2014 valuation results.

Table IV - 1		
Changes in Liability and Total Normal Cost due to Assumption Changes		
Demographic Assumptions	Liability	Normal Cost
Mortality	\$ 20,033,777	\$ 405,096
Disability	(1,182,680)	(340,194)
Termination	9,632,917	1,219,759
Retirement	(16,324,414)	(62,589)
New entrants	<u>4,170,891</u>	<u>134,841</u>
Sub Total	\$ 16,330,491	\$ 1,356,913
Economic Assumptions		
Salary Scale	\$ (14,509,297)	\$ (1,477,979)
Discount Rate Change	<u>57,957,510</u>	<u>1,628,968</u>
Sub Total	\$ 43,448,213	\$ 150,989
All Changes	\$ 59,778,704	\$ 1,507,902

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

**SECTION IV
COST IMPACT**

Table IV - 2				
Impact on July 1, 2014 Liabilities resulting from Economic and Demographic Changes (\$ millions)				
	Current Assumptions	All Other Alternative Assumptions	Discount Rate Change	
Actuarial Accrued Liability	\$ 2,210.3	\$ 2,212.1		\$ 2,270.1
Actuarial Value of Assets	<u>1,540.3</u>	<u>1,540.3</u>		<u>\$ 1,540.3</u>
Unfunded/(Surplus) AAL	\$ 669.99	\$ 671.81		\$ 729.8
Funded Percent	69.7%	69.6%		67.9%
Contribution Amount	\$ 87.0	\$ 91.1		\$ 97.58
Contribution Rate	21.67%	22.71%		24.3%
Difference due to changes in assumptions				
Actuarial Accrued Liability		\$ 1.8		\$ 58.0
Actuarial Value of Assets		<u>0</u>		<u>\$ 0</u>
Unfunded/(Surplus) AAL		\$ 1.8		\$ 58.0
Funded Percent		-0.1%		-1.8%
Contribution Amount		\$ 4.2		\$ 6.4
Contribution Rate		1.0%		1.6%

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

APPENDIX A
CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

A. Long-Term Assumptions Used to Determine System Costs and Liabilities

1. Demographic Assumptions

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.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

APPENDIX A
CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

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 10 years.
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	0.000797	0.000295	0.00005
30	0.000890	0.000381	0.00005
35	0.001048	0.000520	0.00005
40	0.001506	0.000766	0.00005
45	0.002343	0.001025	0.00005
50	0.003908	0.001548	0.00005
55	0.006929	0.002647	0.00005
60	0.012840	0.005341	0.00005
65	0.021779	0.010165	0.00005
69	0.031273	0.014398	0.00005

*Rates for individuals who are the age shown as of June 30, 2014.

Post-retirement mortality:

1. Retirees and Beneficiaries – 1994 Uninsured Pensioners Generational Mortality table (Male + 4, Female + 1) projected 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	0.00693	0.00265	0.05392	0.02529
60	0.01284	0.00534	0.06435	0.03138
65	0.02178	0.01017	0.07679	0.04088
70	0.03396	0.01568	0.09558	0.05568
75	0.05599	0.02616	0.12298	0.07841
80	0.09165	0.04563	0.16115	0.11274

*Rates for individuals who are the age shown as of June 30, 2014.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

APPENDIX A
CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

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 yrs	30 yrs	More than 30 yrs
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 five years of service and 30 years of service).

Terminated vested participants are assumed to retire at age 65.

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.

2. Economic Assumptions

Discount rate:

A liability weighted discount rate is expected on the basis that a 7.75% rate is applied in measuring active participant liabilities, and a 6.55% rate is applied for measuring non-active participant liabilities. The weighted discount rate this year is 7.09%.

Investment return:

The investment return assumption is 7.75% net of all expenses.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

APPENDIX A
CURRENT 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

Social security wage base:

3.00% per year compounded annually (effective 6/30/2011).

Inflation:

2.75% (effective 6/30/2011).

Cost-of-Living adjustment assumption:

1.5% for inactives in pay status under age 65 and 2.0% over age 65.

Percent married:

Males 90%, females 80%.

Spouse age:

A husband is assumed to be four years older than his wife.

Remarriage rates:

None.

APPENDIX A
CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

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.

Job Elimination Benefit:

A liability load of 1.75% is applied to active retirement benefits to account for the value of this benefit.

APPENDIX A
CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

Entry Age Normal Funding Method

The Entry Age Normal actuarial funding method was used for active employees, whereby the normal cost is computed as the level annual percentage of pay required to fund the retirement benefits between each member's date of hire and assumed retirement. The actuarial liability is the difference between the present value of future benefits and the present value of future normal cost. The unfunded actuarial liability is the difference between the actuarial liability and the actuarial value of assets.

Actuarial Assumptions and Methods

Method of Funding:

The Entry Age Normal Funding Method was approved by the Board of Trustees effective date of 7/1/2012.

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

Asset Valuation:

The actuarial value of assets is equal to the market value, adjusted for 20% of the five year aggregate investment surpluses and deficits. 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. One-fifth of the excess earnings are recognized in the actuarial value as of the current valuation and four-fifths are deferred to future years.
3. The net assets are then adjusted to account for the Normal Cost Reserve held for the plan changes made during 2001.
4. The present value of the prior year's City contributions is added to the net assets to account for the one-year lag between required contributions and when the contributions are actually received.
5. 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.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

APPENDIX B
PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

All changes from the current assumptions found in Appendix A are highlighted below.

A. Long-Term Assumptions Used to Determine System Costs and Liabilities

1. Demographic Assumptions

Withdrawal:

Service	Rate
0	14.50%
1	13.50
2	11.50
3	9.00
4	8.00
5	8.00
6	7.00
7	6.00
8	4.00
9	4.00
10	4.00
11	4.00
12	4.00
13	3.00
14	3.00
15+	3.00

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	0.00073	0.00005	0.00010
40	0.00190	0.00006	0.00013
45	0.00332	0.00009	0.00018
50	0.00394	0.00012	0.00023
55	0.00567	0.00013	0.00025
60	0.00715	0.00034	0.00068
65	0.00130	0.00038	0.00076
69	0.00078	0.00039	0.00078

Workers compensation offset is included in the above rates.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

APPENDIX B
PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

Pre-retirement mortality:

1. Non-Line-of-Duty – RP 2000 Healthy mortality with generational projections using 50% AA scale projected 15 years with a three year set forward for both males and females.
2. Line-of-Duty - 0.005% at all ages. (effective 6/30/1999).

Age	Non-Line-of-Duty Death* Male	Non-Line-of-Duty Death* Female	Line-of-Duty Death*
25	0.000365	0.000211	0.00005
30	0.000608	0.000365	0.00005
35	0.000928	0.000551	0.00005
40	0.001223	0.000837	0.00005
45	0.001687	0.001271	0.00005
50	0.002546	0.001942	0.00005
55	0.004570	0.003694	0.00005
60	0.008876	0.007366	0.00005
65	0.016084	0.012950	0.00005
69	0.024553	0.019903	0.00005

*Rates for individuals who are the age shown as of June 30, 2014.

Post-retirement mortality:

1. Retirees and Beneficiaries – RP 2000 Healthy mortality with generational projections using 50% AA scale projected 15 years with two-year set forward for both males and females.
2. Disabled members – RP 2000 Disabled mortality with generational projections using the 50% AA scale projected 15 years with four-year set forward for both males and females.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

APPENDIX B
PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

Age	Retirees and Beneficiaries*		Disabled Members	
	Male	Female	Male	Female
55	0.004067	0.003275	0.035243	0.019556
60	0.007763	0.006412	0.042824	0.025620
65	0.014467	0.011715	0.053651	0.034033
70	0.024368	0.019903	0.069235	0.047093
75	0.042215	0.032115	0.093052	0.063837
80	0.074656	0.053410	0.125150	0.088989

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 yrs	30 yrs	More than 30 yrs
45-49	0.00	0.10	0.00
50-54	0.00	0.10	0.05
55	0.03	0.10	0.05
56-57	0.04	0.10	0.05
58	0.05	0.10	0.05
59	0.05	0.10	0.10
60	0.05	0.10	0.10
61	0.07	0.20	0.15
62	0.15	0.20	0.25
63	0.11	0.20	0.20
64	0.14	0.20	0.17
65	0.20	0.30	0.25
66	0.20	0.20	0.25
67	0.17	0.20	0.20
68	0.15	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 five years of service and 30 years of service).

Terminated vested participants are assumed to retire at age 65.

APPENDIX B
PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

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.

2. Economic Assumptions

Discount rate:

A liability weighted discount rate is expected on the basis that a 7.65% rate is applied in measuring active participant liabilities, and a 6.45% rate is applied for measuring non-active participant liabilities. The weighted discount rate this year is 7.00%.

Investment return:

The investment return assumption is 7.5% net of all expenses.

EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF BALTIMORE
EXPERIENCE STUDY RESULTS

APPENDIX B
PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

Salary increases:

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

Age	Salary
20	6.30%
25	5.80
30	5.30
35	4.70
40	4.10
45	3.70
50	3.50
55	3.50
60	3.50
65	3.50
69	3.50

Social security wage base:

2.67% per year compounded annually (effective 6/30/2015).

Inflation:

2.65% (effective 6/30/2015).

Cost-of-Living adjustment assumption:

1.5% for inactives in pay status under age 65 and 2.0% over age 65.

Percent married:

Males 90%, females 80%.

Spouse age:

A husband is assumed to be four years older than his wife.

Remarriage rates:

None.

APPENDIX B
PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

Expenses:

Investment expenses are assumed to be paid out of investment earnings.

Administrative expenses are expected to be equal to the prior years' actual expenses rounded up to the next hundred thousand dollars and added as part of the annual normal cost for the year.

Job Elimination Benefit:

A liability load of 1.75% is applied to active retirement benefits to account for the value of this benefit.

New Entrant Assumption:

A liability load of 0.5% is applied to active benefits to account for future new entrants who may have previous years of service restored or transferred into the System.

APPENDIX B
PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

Entry Age Normal Funding Method

The Entry Age Normal actuarial funding method was used for active employees, whereby the normal cost is computed as the level annual percentage of pay required to fund the retirement benefits between each member's date of hire and assumed retirement plus administrative expenses. The actuarial liability is the difference between the present value of future benefits and the present value of future normal cost. The unfunded actuarial liability is the difference between the actuarial liability and the actuarial value of assets.

Actuarial Assumptions and Methods

Method of Funding:

The Entry Age Normal Funding Method was approved by the Board of Trustees effective date of 7/1/2012.

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

Asset Valuation:

The actuarial value of assets is equal to the market value, adjusted for 20% of the five year aggregate investment surpluses and deficits. 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. One-fifth of the excess earnings are recognized in the actuarial value as of the current valuation and four-fifths are deferred to future years.
3. The net assets are then adjusted to account for the Normal Cost Reserve held for the plan changes made during 2001.
4. The present value of the prior year's City contributions is added to the net assets to account for the one-year lag between required contributions and when the contributions are actually received.

APPENDIX B

PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

5. 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.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

Highlights

The following plan provisions were changed since the 2013 actuarial valuation:

1. Employees hired or rehired on or after July 1, 2014 will be classified under new Class D membership. New employees will have the option to participate in both the Employees' Retirement System and the new Retirement Savings Plan (RSP) as hybrid members or opt out of the System and participate only in the RSP as non-hybrid members.
2. Class D members will receive a benefit of 1.0% of Average Final Compensation time years of service or an enhanced benefit of 1.1% of Average Final Compensation times years of service if the member retires with 20 or more years of service. Additionally, the City will contribute 3% of pay to RSP for hybrid members and 4% of pay for non-hybrid members. Members also have the option to make voluntary deferrals to the City's Deferred Compensation Plan, with the City matching 50% of the first 2% of compensation deferred by the member.

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 four 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 – there are no remaining active Class B participants as of June 30, 2011.
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.
4. Class D – Members who were hired or rehired on or after July 1, 2014. Class D Members will have the option to participate in both the Employees' Retirement System and the new

APPENDIX C
SUMMARY OF PLAN PROVISIONS

Retirement Savings Plan (RSP) as hybrid members or opt out of the System and participate only in the RSP as non-hybrid members.

Member Contributions

Class C members (except participants of Detention Services and Department of Education) begin making contributions at 1.0% of compensation starting July 1, 2013 increasing 1.0% each year until they reach 5.0% of compensation. Plan A and Plan B members currently contribute at the rate of 4% of earnable compensation and contributions are not required upon attaining age 60 and completing 35 years of service. Class D members will make contributions at 5.0% of pay from date of participation. Interest is credited on contributions at a rate of 5.25% per annum for Plan A and B members and 3.00% for Plan C and Plan D members.

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.

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. Classes C and D

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.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

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. Classes C and D – 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.

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

1. 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.
2. Eligible for a Termination Retirement Allowance, payable immediately, upon completing 20 years of service, if removed from a position without fault.
3. Eligible for a refund of accumulated contributions if not eligible for any other benefits.

2. Classes C and D

1. 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.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

2. 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:

- a. An annuity of the actuarial equivalent of a member's accumulated contributions; and
- b. 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.

3. Class D

A pension of 1.00% of Average Final Compensation, times years of service. If the member retires at or after age 62 with at least 20 years of service the member receives an enhanced benefit of 1.10% of Average Final Compensation times years of service.

B. Early Retirement:

1. Classes C and D

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:

- a. Worker's compensation (excluding amounts paid to third parties);

APPENDIX C
SUMMARY OF PLAN PROVISIONS

- b. 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. Classes C and D

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:

- a. Worker's compensation (excluding amounts paid to third parties);
- b. 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.

E. Dismemberment Disability Retirement:

1. Classes C and D

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.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

- 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 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. Classes C and D

- 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.

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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.

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.