

BAY COUNTY EMPLOYEES' RETIREMENT SYSTEM
REVIEW OF SYSTEM EXPERIENCE
JANUARY 1, 2003 THROUGH DECEMBER 31, 2011



July 3, 2013

The Board of Trustees
Bay County Employees'
Retirement System
Bay City, Michigan

Dear Board Members:

Presented in this report are the results of a review of Retirement System experience. The investigation was conducted for the purpose of updating the actuarial assumptions used in valuing the Bay County Employees' Retirement System actuarial liabilities, assets and actuarially determined employer contribution rates.

The investigation was based upon the data furnished for the annual actuarial valuations during the period *January 1, 2003 through December 31, 2011*.

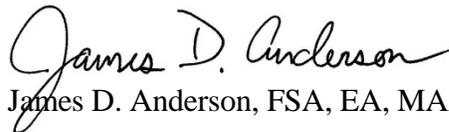
We have shown the expected impact of the proposed changes on County contribution rates as of December 31, 2011. This information is shown in Section D of this report.

The actuaries submitting this report are Members of the American Academy of Actuaries (MAAA) and meet the qualification standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

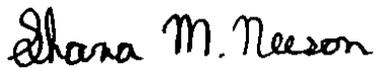
Respectfully submitted,



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INTRODUCTION

Each year, as of December 31st, the actuarial liabilities of the Bay County Employees' Retirement System are valued. In order to perform the valuation, assumptions must be made regarding the future experience of the System with regard to the following risk areas:

- Rates of **termination** of active members
- Rates of **disability** among active members
- Rates of **retirement** among active members
- Rates of **mortality** among active members, retirants and beneficiaries
- Long-term rates of **investment return** to be generated by the assets of the System
- Patterns of **salary increases** to active members

Assumptions should be carefully chosen and continually monitored. Continued use of outdated assumptions can lead to:

- Understated costs resulting in either an inability to pay benefits when due, or sharp increases in required contributions at some point in the future;
- Overstated costs resulting in either benefit levels that are kept below the level that could be supported by the computed rate or an unnecessarily large burden on the current generation of members, employers and taxpayers.

A single set of assumptions will not be suitable indefinitely. Things change, and our understanding of things also changes. In recognition of this, assumptions used to value the liabilities of the Retirement System should be reviewed and adjusted periodically to recognize changes in experience trends, a changing economic environment (or changing perceptions of the economic environment) and to maintain consistency within the universe of public employee retirement systems.

A common practice among public employee retirement systems is that the actuary recommends a set of demographic assumptions and suggests a range of reasonable alternate economic assumptions. Following discussion involving the actuary, the plan governing body, and other professionals, the plan governing body makes a final choice from the various alternatives.

SECTION A

DEMOGRAPHIC ASSUMPTIONS

RETIREMENT

Discussion: Rates of retirement are used to measure the probabilities of an eligible member retiring from County employment during the next year. During the study period, actual rates of retirement for the Bay County Employees' Retirement System have been higher than expected for every group except for the Sheriff's Department.

Summary of Experience: The experience during the study period is summarized below:

Number of Retirements Among Eligible System Members		
Department	Actual	Expected
General	133	99.9
DWS	17	5.3
Library	14	13.0
BABH	28	23.6
Medical Care Facility	83	37.0
Sheriff's Department	14	17.0
Road Commission	36	23.7
Total	325	219.5

Proposal: We recommend an increase in the rates for the General, DWS, Medical Care Facility (MCF) and Road Commission groups. The current and proposed retirement rates are shown on the following page. This change will put upward pressure on liabilities.

CURRENT RATES OF RETIREMENT

Retirement Ages	Percent of Active Members Retiring Within Next Year						
	General	DWS	Library	BABH	MCF	Sheriff's	Road Commission
50					10 %		10 %
51					10		10
52					10		20
53					10		20
54					10		20
55	15 %	15 %	15 %	15 %	20		20
56	10	10	10	10	30		10
57	10	10	10	10	40		10
58	10	10	10	10	40		10
59	10	10	10	10	40		10
60	25	25	25	25	20	15 %	10
61	20	20	20	20	20	15	10
62	10	10	10	10	40	30	30
63	10	10	10	10	15	15	30
64	10	10	10	10	15	15	30
65	25	25	25	25	100	100	100
66	10	10	10	10			
67	10	10	10	10			
68	10	10	10	10			
69	10	10	10	10			
70	100	100	100	100			

The following table shows the rates used for the Road Patrol and Road Patrol Supervisory Unit 25 & Out provision and the Correctional Facility Officers 55 & 25 provision.

25 & Out		55 & 25	
Years of Service	Sheriff's Road Patrol and Road Patrol Supervisory Unit	Age	Correctional Facility Officers
25	40%	55	40%
26	40	56	40
27	40	57	40
28	25	58	25
29	25	59	25
30	25	60	25
31	25	61	25
32	25	62	25
33	25	63	25
34	100	64	100

PROPOSED RATES OF RETIREMENT

Retirement Ages	Percent of Active Members Retiring Within Next Year						Road
	General	DWS	Library	BABH	MCF	Sheriff's	Commission
50					20 %		15 %
51					20		15
52					20		25
53					20		25
54					20		25
55	20 %	25 %	15 %	15 %	30		25
56	15	20	10	10	40		15
57	15	20	10	10	50		15
58	15	20	10	10	50		15
59	15	20	10	10	50		15
60	30	35	25	25	30	15 %	15
61	25	30	20	20	30	15	15
62	15	20	10	10	50	30	35
63	15	20	10	10	25	15	35
64	15	20	10	10	25	15	35
65	30	35	25	25	100	100	100
66	15	20	10	10			
67	15	20	10	10			
68	15	20	10	10			
69	15	20	10	10			
70	100	100	100	100			

The following table shows the rates used for the Road Patrol and Road Patrol Supervisory Unit 25 & Out provision and the Correctional Facility Officers 55 & 25 provision.

25 & Out		55 & 25	
Years of Service	Sheriff's Road Patrol and Road Patrol Supervisory Unit	Age	Correctional Facility Officers
25	40%	55	40%
26	40	56	40
27	40	57	40
28	25	58	25
29	25	59	25
30	25	60	25
31	25	61	25
32	25	62	25
33	25	63	25
34	100	64	100

CURRENT RATES OF EARLY RETIREMENT

55 & 8 and/or 55 & 10 Early Retirement	
Retirement	
Ages	All
55	5 %
56	5
57	5
58	5
59	5

PROPOSED RATES OF EARLY RETIREMENT

55 & 8 and/or 55 & 10 Early Retirement			
Retirement			All Other
Ages	General	DWS	Groups
55	10 %	15 %	5 %
56	10	15	5
57	10	15	5
58	10	15	5
59	10	15	5

TURNOVER

Discussion: During the study period, actual rates of termination for the Medical Care Facility (MCF) group have been higher than expected and rates of termination for the Sheriff's Department have been less than expected. This experience suggests a need to increase the assumed rates of termination for the MCF group, and decrease the assumed rates of termination for the Sheriff Department employees. The tables on the current and following pages summarize recent experience and the current and proposed rates of termination.

Summary of Experience: The experience during the study period is summarized below:

Number of Employee Terminations from County Employment		
Department	Actual	Expected
General	154	151.1
DWS	4	10.2
Library*	48	18.5
BABH	82	96.2
Medical Care Facility	229	166.7
Sheriff's Department	7	14.9
Road Commission	3	4
Total	527	461.6

Proposal: Change the current turnover rates to the proposed rates summarized on the following page. In general, increasing the assumed rates of termination will put downward pressure on liabilities and vice-versa.

* *Library turnover was higher than expected due to events related to the millage. Since these events are considered onetime anomalies and many of these members were subsequently rehired, no change is recommended at this time.*

CURRENT TURNOVER RATES

% of Active Members Separating within Next Year

Sample Ages	Years of Service	% of Active Members Separating within Next Year					Road	
		General	DWS	Library	BABH	MCF	Sheriff's*	Commission*
ALL	0	15.00%	15.00%	15.00%	15.00%	20.00%	N/A	N/A
	1	9.00	9.00	9.00	9.00	20.00	N/A	N/A
	2	9.00	9.00	9.00	9.00	12.00	N/A	N/A
	3	8.00	8.00	8.00	8.00	10.00	N/A	N/A
	4	8.00	8.00	8.00	8.00	7.00	N/A	N/A
20	5 & Over	7.50	7.50	7.50	7.50	6.00	6.00	4.50
25		7.50	7.50	7.50	7.50	6.00	6.00	4.50
30		7.00	7.00	7.00	7.00	4.00	5.00	3.90
35		7.00	7.00	7.00	7.00	4.00	3.00	2.30
40		4.00	4.00	4.00	4.00	3.00	2.00	0.90
45		3.00	3.00	3.00	3.00	2.00	2.00	0.50
50	2.00	2.00	2.00	2.00	1.50	1.50	0.50	
55	2.00	2.00	2.00	2.00	1.50	1.00	0.50	
60	2.00	2.00	2.00	2.00	1.50	1.00	0.50	

* These groups do not have service based rates of separation. All rates of separation are based on age.

PROPOSED RATES OF TURNOVER

Sample Ages	Years of Service	% of Active Members Separating within Next Year					Road	
		General	DWS	Library	BABH	MCF	Sheriff's*	Commission*
ALL	0	15.00%	15.00%	15.00%	15.00%	25.00%	N/A	N/A
	1	9.00	9.00	9.00	9.00	25.00	N/A	N/A
	2	9.00	9.00	9.00	9.00	15.00	N/A	N/A
	3	8.00	8.00	8.00	8.00	12.50	N/A	N/A
	4	8.00	8.00	8.00	8.00	8.75	N/A	N/A
20	5 & Over	7.50	7.50	7.50	7.50	7.50	4.50	4.50
25		7.50	7.50	7.50	7.50	7.50	4.50	4.50
30		7.00	7.00	7.00	7.00	5.00	3.75	3.90
35		7.00	7.00	7.00	7.00	5.00	2.25	2.30
40		4.00	4.00	4.00	4.00	3.75	1.50	0.90
45		3.00	3.00	3.00	3.00	2.50	1.50	0.50
50		2.00	2.00	2.00	2.00	2.00	1.25	0.50
55	2.00	2.00	2.00	2.00	2.00	0.75	0.50	
60	2.00	2.00	2.00	2.00	2.00	0.75	0.50	

* These groups do not have service based rates of separation. All rates of separation are based on age.

DISABILITY

Discussion: The actual number of disability retirements was slightly lower than expected for all groups except the Sheriff's Department and MCF during the study period.

Number of Active Members Separating During Next Year		
Department	Actual	Expected
General	4	6.0
DWS	0	0.8
Library	0	0.6
BABH	1	2.7
Medical Care Facility	7	5.3
Sheriff's Department	4	1.3
Road Commission	0	1.8
Total	16	18.5

Proposal: Given the limited Plan experience we recommend a slight increase in the present probabilities of disability retirement for the Sheriff's Department and a slight decrease to the disability rate for all other groups. Increasing the disability rate will put slight upward pressure on liabilities. The current and proposed rates of disability are shown on the following page.

CURRENT RATES OF DISABILITY

Sample Ages	Percent Becoming Disabled within Next Year
20	0.08 %
25	0.08
30	0.08
35	0.08
40	0.20
45	0.27
50	0.49
55	0.89
60	1.41

PROPOSED RATES OF DISABILITY

Sample Ages	Percent Becoming Disabled within Next Year	
	Sheriff	All Other Groups
20	0.12 %	0.06 %
25	0.12	0.06
30	0.12	0.06
35	0.12	0.06
40	0.30	0.15
45	0.40	0.20
50	0.74	0.37
55	1.34	0.67
60	2.12	1.06

MORTALITY

Discussion: The mortality assumption is used to measure the probabilities of members dying before retirement and the probability of each benefit payment being made after retirement. The mortality table currently used for healthy lives in the annual valuation of the System is the 1994 Group Annuity Mortality Table with ages setback one year for both men and women. While there were slightly more deaths than expected among retirees over the experience period, the membership in this group is not sufficiently large enough to determine if there is margin for mortality experience. National trends indicate longevity improvements. Based on our experience with a broad cross section of public sector plans similar in nature to this plan, it is our opinion that the current mortality assumption be updated.

Proposal: We recommend updating the post retirement mortality assumption to use RP-2000 Mortality Combined Healthy Tables, projected 20 years with U.S. Projection Scale BB (multiplied by 110% for both males and females). Rates for disabled members were set forward 10 years. The current and proposed future life expectancy assumptions are shown on the next page. This change will have upward pressure on liabilities.

SUMMARY OF LIFE EXPECTANCIES UNDER THE CURRENT TABLE

Sample Ages	Future Life Expectancy (Years)	
	Men	Women
50	31.62	35.84
55	27.04	31.11
60	22.67	26.49
65	18.60	22.11
70	14.97	18.08
75	11.72	14.31
80	8.87	10.93

SUMMARY OF LIFE EXPECTANCIES UNDER THE PROPOSED TABLE

Sample Ages	Future Life Expectancy (Years)	
	Men	Women
50	32.15	34.70
55	27.56	30.04
60	23.16	25.50
65	19.01	21.19
70	15.16	17.19
75	11.66	13.58
80	8.62	10.36

MERIT AND LONGEVITY PORTION OF PAY INCREASES

Discussion: Pay increases granted to individual active members consist in principle of two parts. The first part is an across-the-board economic type of increase related to inflation or cost-of-living changes. The second part, merit and/or longevity increases, relates to the performance of individual active members during a given year. Merit and longevity may include promotions and pay increases related to years of experience. Overall, merit and longevity pay increases were lower than expected during the experience period.

Proposal: Lower the rates of merit and longevity for all groups. The current and proposed rates are shown below:

Current Rates

Years of Service	Annual Rate of Pay Increase for Merit & Longevity						
	General	DWS	Library	BABH	MCF	Sheriff's	Road Commission
1	5.00%	5.00%	5.00%	5.00%	1.00%	8.00%	8.00%
2	4.00%	4.00%	4.00%	4.00%	1.00%	7.00%	5.00%
3	3.00%	3.00%	3.00%	3.00%	1.00%	7.00%	5.00%
4	3.00%	3.00%	3.00%	3.00%	1.00%	6.00%	5.00%
5	1.00%	1.00%	1.00%	1.00%	1.00%	5.00%	1.00%
6+	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

Proposed Rates

Years of Service	Annual Rate of Pay Increase for Merit & Longevity						
	General	DWS	Library	BABH	MCF	Sheriff's	Road Commission
1	3.75%	3.75%	3.75%	3.75%	0.75%	6.00%	6.00%
2	3.00%	3.00%	3.00%	3.00%	0.75%	5.25%	3.75%
3	2.25%	2.25%	2.25%	2.25%	0.75%	5.25%	3.75%
4	2.25%	2.25%	2.25%	2.25%	0.75%	4.50%	3.75%
5	0.75%	0.75%	0.75%	0.75%	0.75%	3.75%	0.75%
6+	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%

SECTION B

ECONOMIC ASSUMPTIONS

ECONOMIC ASSUMPTIONS INVESTMENT RETURN AND WAGE INFLATION

Considerations in establishing economic assumptions include:

- Historical patterns
- Economic forecasts
- Investment policy
- Funding level
- Generally accepted practice
- Acceptable level of risk of having to increase future contributions
- Appropriate balance between generations of participants and taxpayers

Only hindsight will tell whether a particular combination of economic assumptions is optimal. If the economic environment remains favorable, a change to more optimistic assumptions provides a reasonable means of freeing up contribution dollars today. The trade-off is that additional risk is incurred. If a change proves to be overly optimistic, future contributions will increase.

Current economic assumptions for the Bay County Employees' Retirement System are as follows:

Net Investment Return	7.5%
Wage Inflation	4.0%
Price Inflation	3.0%

Price Inflation. In past years, no specific price inflation assumption was necessary in order to perform the actuarial valuation. However, price inflation is a key component of the underlying wage inflation and interest rate assumptions and must now be disclosed in actuarial reports. The chart on the following page shows historical averages of both price and wage inflation. While long term historical averages approach 4.0%, short term averages are generally between 2.0% and 3.0%. Most investment firms expect inflation to be between 2.0% and 3.0% (see chart on page 15), and the 2012 annual report of the Social Security Trustees uses 2.8% as the intermediate assumption. **We believe the current assumption is reasonable and recommend no change at this time.**

**SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS
(CONTINUED)**

Year	Annual Increase in		
	Prices (CPI-U)	Wages (NAE)	Difference
3-Year Avg	2.1%	3.1%	1.0%
5-Year Avg	1.8%	2.0%	0.2%
10-Year Avg	2.4%	3.0%	0.6%
20-Year Avg	2.4%	3.4%	1.0%
30-Year Avg	2.9%	3.8%	0.9%
50-Year Avg	4.1%	4.8%	0.7%

Wage Inflation. The long-term rate of increase in National Average Earnings over the last 50 years is somewhat higher than the current Bay County Employees' Retirement System assumption, although shorter term averages are below it. It is expected that, in the long run, salary increases in all parts of the country will be close to the national averages. However, few economists are forecasting a repeat of the high inflation rates experienced in the 1970s. In addition, average salaries in the Bay County Employees' Retirement System have risen at approximately 2.6% a year since 1992 and approximately 2.2% over the last 10 years. **We believe a reasonable range within which to set this long term assumption is anywhere from 3.0% to 4.0%.**

We have illustrated the approximate impact on contribution requirements if the wage inflation assumption were changed from 4.0% to 3.5% on page 22.

SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS (CONTINUED)

Investment Return and Spread. The Bay County Employees' Retirement System's asset mix is approximately 65% in equities (common stock, real estate, and venture capital). Market returns for portfolios with equity holdings at that level have exceeded 7.5% since the early 1980s, although prior to that, returns were much weaker, and real returns were actually negative in some years. Of course, the results of the past decade are causing investment professionals to reconsider their longer term views of the investment markets. As a result, many systems have been lowering their investment return assumption. Although many systems have lowered their investment return assumption, Bay County Employees' Retirement System's current assumption is still well within the mainstream. Each retirement system will have a different investment return assumption given their asset allocation and risk tolerance. Additionally, we have modeled Bay County Employees' Retirement System's current investment portfolio using the expectations of various investment consulting firms. The results on page 17 range from a median 20-year geometric return of 6.95% to a mean return of 7.77%. The current return assumption of 7.5% lies within the reasonable range. Keep in mind that we are not investment experts and this analysis is based on broad ranges and average of averages.

GRS recommends seeking advice from Bay County Employees' Retirement System's investment consultants prior to making a significant change in the investment return assumption.

We have illustrated the approximate impact on contribution requirements if the investment return assumption were changed to 7.25% on page 22.

**SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS
(CONCLUDED)**

Investment Return Expectations of Various Investment Consultants

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding 7.50% *	Expected Nominal Rate of Return **
	25th	50th	75th		
(1)	(2)	(3)	(4)	(5)	(4)
1	4.32%	6.16%	8.04%	31.5%	6.90%
2	4.39%	6.20%	8.04%	31.7%	6.91%
3	4.79%	6.68%	8.60%	38.6%	7.45%
4	4.66%	6.65%	8.68%	38.9%	7.51%
5	5.68%	7.39%	9.13%	48.3%	8.02%
6	5.57%	7.48%	9.43%	49.8%	8.27%
7	5.05%	7.29%	9.59%	47.6%	8.39%
8	5.66%	7.77%	9.92%	53.4%	8.73%
Average	5.02%	6.95%	8.93%	42.5%	7.77%

*Plan's current return assumption net of expenses.

**Based on 3.0% Price Inflation

2003 – 2011 EXPERIENCE ANALYSIS

HISTORICAL PATTERNS OF INVESTMENT RETURN, PAY INCREASES & INFLATION

* Sample Balanced Fund	
Equities	65%
Bonds - Government	20%
- Corporate	14%
Cash Equivalents	1%
	100%

# Historical Spread	
# Observed spread is very sensitive to the observation period, even over long periods, as illustrated below:	
Observation Period	Spread
63 years	5.1%
53 years	4.5%
43 years	5.2%
33 years	7.0%

Calendar Year Period	Gross Market Returns			Stocks (S&P 500)	Price Inflation (CPI)	National Average Earnings	Sample Balanced Fund*	
	Bonds (Long)		Cash Equiv. (T Bills)				Total Return (I)	Spread: I - NAE
	U.S. Treasury	Corp. (S&P AA)						
1950-1959	(0.1)%	1.0 %	1.9 %	19.4 %	2.2 %	4.5 %	13.2 %	8.7 %
1960-1969	1.4 %	1.7 %	3.9 %	7.8 %	2.5 %	4.3 %	5.9 %	1.6 %
1970-1979	5.5 %	6.2 %	6.3 %	5.9 %	7.4 %	6.9 %	6.2 %	(0.7)%
1980-1989	12.6 %	13.0 %	8.9 %	17.5 %	5.1 %	5.8 %	16.1 %	10.3 %
1990-1999	8.8 %	8.4 %	4.9 %	18.2 %	2.9 %	4.2 %	14.9 %	10.7 %
2000-2009	7.7 %	7.6 %	2.8 %	(0.9)%	2.5 %	2.9 %	2.9 %	0.0 %
2010	10.1 %	12.4 %	0.1 %	15.1 %	1.5 %	2.4 %	13.7 %	11.3 %
2011	28.2 %	18.0 %	0.0 %	2.1 %	3.0 %	3.1 %	8.9 %	5.8 %
2012	3.3 %	10.7 %	0.1 %	16.0 %	1.7 %	3.9 %	13.0 %	9.1 %
Last 63 Years	6.3 %	6.6 %	4.5 %	11.0 %	3.7 %	4.7 %	9.8 %	5.1 % #

Note: Market index returns do not reflect investment expense (commissions and management fees). Those expenses generally range from 0.25% to 1.0% of assets. The net real rate of return for a plan that pays its own investment expenses would be correspondingly lower.

SECTION C

MISCELLANEOUS ASSUMPTIONS AND METHODS

OPTION FACTORS

Option factors are calculated using the current interest assumption and the assumed rates of mortality. If a retiring member elects an optional form of benefit, the assumed benefit is multiplied by the appropriate option factor to produce the benefit actually payable. As a matter of common practice, option factors are usually revised to correspond to the new interest and mortality assumptions adopted with an experience study.

Currently, option factors for survivor benefits are calculated using a 7.5% interest rate assumption and current assumed rates of mortality. If our recommended mortality tables are adopted we recommend change to the option factors. Examples of option factors calculated using the old and new mortality assumptions are shown below. If the new assumptions are adopted, we recommend the new actuarial factors be adopted for retirements on or after January 1, 2014 to allow time for administrative changes. We would also recommend that any such change be reviewed by legal counsel.

<i>Age</i>		Option B-100		Option C-50	
		100% Joint & Survivor with Pop-up		50% Joint & Survivor with Pop-up	
Ret.	Ben.	Old	New	Old	New
50	45	0.92410	0.92401	0.96055	0.96051
55	50	0.89863	0.89948	0.94661	0.94708
60	55	0.86596	0.86853	0.92816	0.92964
65	60	0.82753	0.83103	0.90563	0.90772

AMORTIZATION POLICY

The current actuarial valuation report computes contribution amounts using a 30-year open amortization period for groups that are underfunded and a 10-year open amortization period for overfunded groups. This method will result in a growing unfunded liability. We recommend that the amortization policy be changed to a 'closed' period for unfunded liabilities. This method will result in a more level contribution rate and systematic pay down of the unfunded liability. This change will also help avoid having to use a lower discount rate under the new GASB accounting rules.

ASSET VALUATION METHOD

The Bay County Employees' Retirement System currently uses a 5-year asset smoothing method with no corridor. The Funding Value of Assets recognizes assumed investment income fully each year. Differences between actual and assumed investment income are phased-in over a closed 5-year period. This is a very common method among public retirement systems. Most systems use an averaging period between 3 and 10 years with 5 being the most common. We do not recommend any changes at this time. If, however, the Board has concerns over the volatility of contributions, a smoothing period of 6 or 7 years could be considered. If the smoothing period was lengthened, we would recommend establishing a 'corridor', so that the Funding Value will not diverge too far from the actual Market Value. Systems which use a corridor will vary on the amount of the corridor, but it is typically between 10% and 30%.

LOAD IN FAC FOR UNUSED SICK AND VACATION TIME

Unused vacation and sick leave can be rolled into final average compensation at time of retirement. As a result our valuation includes a percent load to account for this provision. We analyzed the final average compensation with and without the unused vacation and sick leave for all members who retired during the period 2003 to 2011. Based on the results of this analysis we recommend the following change:

<u>Division</u>	<u>Actual</u>	<u>Current Assumption</u>	<u>Proposed Assumption</u>
General	3.15%	6.0%	4.5%
DWS	7.74	6.0	7.0
Library	2.89	6.0	4.5
BABH	3.79	6.0	5.0
MCF	4.94	10.0	7.5
Sheriff's Department	6.13	6.0	6.0
Road Commission	7.82	10.5	9.0

SUMMARY OF CURRENT AND PROPOSED ASSUMPTIONS

Assumption Set	Economic Assumptions			Non-Economic Assumptions	
	Net Rate of Investment Return	Rate of Inflation		Amortization Period (Years)	Demographic
		Wage	Spread		
A. Base	7.50%	4.00%	3.50%	Closed	Current
B. Proposed Demographic	7.50	4.00	3.50	Closed	Proposed
C. Alternate I Economic	7.25	4.00	3.25	Closed	Proposed
D. Alternate II Economic	7.50	3.50	4.00	Closed	Proposed

SECTION D

CONTRIBUTION RATES BASED ON PROPOSED
CHANGES

**EFFECTS OF RECOMMENDED CHANGES IN ACTUARIAL ASSUMPTIONS ON
ACTUARIAL LIABILITIES AND PENSION CONTRIBUTION RATES FOR ALL GROUPS
RESULTS AS OF DECEMBER 31, 2011**

	Funded Percent			
	A	B	C	D
	Baseline	New Decrements	New Decrements with 7.25% Interest	New Decrements with 3.5% Wage Inflation
General	106.7 %	107.7 %	104.7 %	108.7 %
DWS	80.3 %	78.5 %	76.5 %	79.0 %
Library	99.0 %	101.6 %	99.0 %	102.3 %
BABH	90.9 %	93.2 %	90.2 %	94.8 %
MCF	99.6 %	101.5 %	98.7 %	102.4 %
Sheriff	120.1 %	121.0 %	117.6 %	122.0 %
Road Commission	81.9 %	82.3 %	80.2 %	82.8 %
Total	99.8 %	100.9 %	98.1 %	101.9 %

	Employer Contribution Rate			
	A	B	C	D
	Baseline	New Decrements	New Decrements with 7.25% Interest	New Decrements with 3.5% Wage Inflation
General	4.08 %	3.13 %	5.76 %	1.65 %
DWS	13.77 %	14.77 %	16.11 %	14.43 %
Library	9.89 %	8.15 %	9.86 %	7.08 %
BABH	10.17 %	9.22 %	10.30 %	8.41 %
MCF	9.57 %	6.85 %	8.71 %	5.60 %
Sheriff	(4.08)%	(4.31)%	(0.81)%	(6.52)%
Road Commission	20.78 %	20.22 %	22.22 %	19.51 %
Total	8.16 %	7.03 %	8.74 %	6.01 %

SECTION E

COMPLETE LISTING OF RECOMMENDED ASSUMPTIONS

PROPOSED TURNOVER RATES

Proposed Rates								
Percent Separating Within Next Year								
Sample		General	DWS	Library	BABH	MCF	Sheriff's*	Road Commission*
Ages								
ALL	0	15.00%	15.00%	15.00%	15.00%	25.00%	N/A	N/A
	1	9.00	9.00	9.00	9.00	25.00	N/A	N/A
	2	9.00	9.00	9.00	9.00	15.00	N/A	N/A
	3	8.00	8.00	8.00	8.00	12.50	N/A	N/A
	4	8.00	8.00	8.00	8.00	8.75	N/A	N/A
20 & under		7.50	7.50	7.50	7.50	7.50	4.50%	4.50%
21		7.50	7.50	7.50	7.50	7.50	4.50	4.50
22		7.50	7.50	7.50	7.50	7.50	4.50	4.50
23		7.50	7.50	7.50	7.50	7.50	4.50	4.50
24		7.50	7.50	7.50	7.50	7.50	4.50	4.50
25		7.50	7.50	7.50	7.50	7.50	4.50	4.50
26		7.50	7.50	7.50	7.50	7.00	4.25	4.50
27		7.50	7.50	7.50	7.50	6.50	4.25	4.50
28		7.50	7.50	7.50	7.50	6.00	4.00	4.40
29		7.50	7.50	7.50	7.50	5.50	4.00	4.20
30		7.00	7.00	7.00	7.00	5.00	3.75	3.90
31		7.00	7.00	7.00	7.00	5.00	3.50	3.60
32		7.00	7.00	7.00	7.00	5.00	3.25	3.30
33		7.00	7.00	7.00	7.00	5.00	2.75	3.00
34		7.00	7.00	7.00	7.00	5.00	2.50	2.70
35		7.00	7.00	7.00	7.00	5.00	2.25	2.30
36		7.00	7.00	7.00	7.00	4.75	2.00	1.90
37		7.00	7.00	7.00	7.00	4.50	2.00	1.50
38		7.00	7.00	7.00	7.00	4.25	1.75	1.20
39		7.00	7.00	7.00	7.00	4.00	1.75	1.00
40		4.00	4.00	4.00	4.00	3.75	1.50	0.90
41		3.80	3.80	3.80	3.80	3.50	1.50	0.80
42		3.60	3.60	3.60	3.60	3.25	1.50	0.70
43		3.40	3.40	3.40	3.40	3.00	1.50	0.60
44		3.20	3.20	3.20	3.20	2.75	1.50	0.55
45		3.00	3.00	3.00	3.00	2.50	1.50	0.50
46		2.80	2.80	2.80	2.80	2.50	1.50	0.50
47		2.60	2.60	2.60	2.60	2.25	1.25	0.50
48		2.40	2.40	2.40	2.40	2.25	1.25	0.50
49		2.20	2.20	2.20	2.20	2.00	1.25	0.50
50		2.00	2.00	2.00	2.00	2.00	1.25	0.50
51		2.00	2.00	2.00	2.00	2.00	1.00	0.50
52		2.00	2.00	2.00	2.00	2.00	1.00	0.50
53		2.00	2.00	2.00	2.00	2.00	1.00	0.50
54		2.00	2.00	2.00	2.00	2.00	0.75	0.50
55		2.00	2.00	2.00	2.00	2.00	0.75	0.50
56		2.00	2.00	2.00	2.00	2.00	0.75	0.50
57		2.00	2.00	2.00	2.00	2.00	0.75	0.50
58		2.00	2.00	2.00	2.00	2.00	0.75	0.50
59		2.00	2.00	2.00	2.00	2.00	0.75	0.50
60		2.00	2.00	2.00	2.00	2.00	0.75	0.50
61		1.80	1.80	1.80	1.80	2.00	0.75	0.50
62		1.60	1.60	1.60	1.60	2.00	0.75	0.50
63		1.40	1.40	1.40	1.40	2.00	0.75	0.50
64		1.20	1.20	1.20	1.20	2.00	0.75	0.50
65		1.00	1.00	1.00	1.00	2.00	0.75	0.50
66		1.00	1.00	1.00	1.00	2.00	0.75	0.50
67		1.00	1.00	1.00	1.00	2.00	0.75	0.50
68		1.00	1.00	1.00	1.00	2.00	0.75	0.50
69		1.00	1.00	1.00	1.00	2.00	0.75	0.50
70 & over		1.00	1.00	1.00	1.00	2.00	0.75	0.50

* These groups do not have service based rates of separation. All rates of separation are based on age.

PROPOSED RETIREMENT RATES

Retirement Ages	Percent of Active Members Retiring Within Next Year						Road
	General	DWS	Library	BABH	MCF	Sheriff's	Commission
50					20 %		15 %
51					20		15
52					20		25
53					20		25
54					20		25
55	20 %	25 %	15 %	15 %	30		25
56	15	20	10	10	40		15
57	15	20	10	10	50		15
58	15	20	10	10	50		15
59	15	20	10	10	50		15
60	30	35	25	25	30	15 %	15
61	25	30	20	20	30	15	15
62	15	20	10	10	50	30	35
63	15	20	10	10	25	15	35
64	15	20	10	10	25	15	35
65	30	35	25	25	100	100	100
66	15	20	10	10			
67	15	20	10	10			
68	15	20	10	10			
69	15	20	10	10			
70	100	100	100	100			

The following table shows the rates used for the Road Patrol and Road Patrol Supervisory Unit 25 & Out provision and the Correctional Facility Officers 55 & 25 provision.

25 & Out		55 & 25	
Years of Service	Sheriff's Road Patrol and Road Patrol Supervisory Unit	Age	Correctional Facility Officers
25	40%	55	40%
26	40	56	40
27	40	57	40
28	25	58	25
29	25	59	25
30	25	60	25
31	25	61	25
32	25	62	25
33	25	63	25
34	100	64	100

PROPOSED EARLY RETIREMENT RATES

55 & 8 and/or 55 & 10 Early Retirement			
Retirement			All Other
Ages	General	DWS	Groups
55	10 %	15 %	5 %
56	10	15	5
57	10	15	5
58	10	15	5
59	10	15	5

PROPOSED DISABILITY RATES

Percent Becoming Disabled within Next Year					
Sample Ages	Sheriff	All Other Groups	Sample Ages	Sheriff	All Other Groups
20 & Under	0.12 %	0.06 %	40	0.30 %	0.15 %
21	0.12	0.06	41	0.31	0.16
22	0.12	0.06	42	0.32	0.16
23	0.12	0.06	43	0.34	0.17
24	0.12	0.06	44	0.36	0.18
25	0.12	0.06	45	0.40	0.20
26	0.12	0.06	46	0.44	0.22
27	0.12	0.06	47	0.50	0.25
28	0.12	0.06	48	0.57	0.28
29	0.12	0.06	49	0.65	0.32
30	0.12	0.06	50	0.74	0.37
31	0.12	0.06	51	0.84	0.42
32	0.12	0.06	52	0.95	0.48
33	0.12	0.06	53	1.07	0.54
34	0.12	0.06	54	1.20	0.60
35	0.12	0.06	55	1.34	0.67
36	0.19	0.10	56	1.48	0.74
37	0.24	0.12	57	1.63	0.82
38	0.27	0.14	58	1.79	0.89
39	0.29	0.14	59	1.95	0.98
			60	2.12	1.06

PROPOSED MERIT AND LONGEVITY RATES

Years of Service	Annual Rate of Pay Increase for Merit & Longevity						
	General	DWS	Library	BABH	MCF	Sheriff's	Road Commission
1	3.75%	3.75%	3.75%	3.75%	0.75%	6.00%	6.00%
2	3.00%	3.00%	3.00%	3.00%	0.75%	5.25%	3.75%
3	2.25%	2.25%	2.25%	2.25%	0.75%	5.25%	3.75%
4	2.25%	2.25%	2.25%	2.25%	0.75%	4.50%	3.75%
5	0.75%	0.75%	0.75%	0.75%	0.75%	3.75%	0.75%
6+	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%

PROPOSED PRE-RETIREMENT MORTALITY RATES

Sample Ages	% Dying		Sample Ages	% Dying	
	Male	Female		Male	Female
20	0.02%	0.01%	60	0.44%	0.31%
21	0.03%	0.01%	61	0.49%	0.35%
22	0.03%	0.01%	62	0.55%	0.39%
23	0.03%	0.01%	63	0.61%	0.45%
24	0.03%	0.01%	64	0.68%	0.51%
25	0.03%	0.01%	65	0.75%	0.57%
26	0.03%	0.02%	66	0.83%	0.65%
27	0.03%	0.02%	67	0.91%	0.72%
28	0.03%	0.02%	68	0.99%	0.79%
29	0.03%	0.02%	69	1.10%	0.88%
30	0.03%	0.02%	70	1.23%	0.99%
31	0.04%	0.02%	71	1.36%	1.09%
32	0.04%	0.02%	72	1.51%	1.22%
33	0.04%	0.03%	73	1.68%	1.35%
34	0.05%	0.03%	74	1.88%	1.50%
35	0.05%	0.03%	75	2.10%	1.66%
36	0.06%	0.04%	76	2.34%	1.82%
37	0.06%	0.04%	77	2.60%	2.01%
38	0.07%	0.04%	78	2.89%	2.21%
39	0.07%	0.05%	79	3.21%	2.45%
40	0.08%	0.05%	80	3.57%	2.70%
41	0.08%	0.05%	81	3.99%	2.99%
42	0.09%	0.06%	82	4.46%	3.32%
43	0.09%	0.07%	83	4.97%	3.68%
44	0.10%	0.07%	84	5.53%	4.10%
45	0.11%	0.08%	85	6.14%	4.56%
46	0.11%	0.09%	86	6.81%	5.09%
47	0.12%	0.09%	87	7.70%	5.68%
48	0.13%	0.10%	88	8.69%	6.32%
49	0.14%	0.11%	89	9.80%	7.02%
50	0.15%	0.12%	90	11.03%	7.92%
51	0.17%	0.13%	91	12.25%	8.87%
52	0.19%	0.14%	92	13.56%	9.87%
53	0.21%	0.16%	93	14.92%	10.89%
54	0.23%	0.17%	94	16.34%	11.91%
55	0.26%	0.18%	95	17.79%	12.93%
56	0.30%	0.21%	96	19.26%	13.93%
57	0.32%	0.23%	97	20.76%	14.90%
58	0.36%	0.25%	98	21.83%	15.50%
59	0.40%	0.28%	99	23.32%	16.34%
			100	24.33%	16.77%

PROPOSED POST-RETIREMENT MORTALITY RATES

Sample Ages	% Dying*		Sample Ages	% Dying*	
	Male	Female		Male	Female
	20	0.04%		0.02%	60
21	0.04%	0.02%	61	0.72%	0.51%
22	0.04%	0.02%	62	0.80%	0.58%
23	0.04%	0.02%	63	0.90%	0.66%
24	0.04%	0.02%	64	0.99%	0.74%
25	0.04%	0.02%	65	1.10%	0.84%
26	0.04%	0.02%	66	1.22%	0.95%
27	0.04%	0.02%	67	1.33%	1.05%
28	0.04%	0.02%	68	1.45%	1.16%
29	0.04%	0.03%	69	1.61%	1.28%
30	0.05%	0.03%	70	1.81%	1.45%
31	0.05%	0.03%	71	2.00%	1.61%
32	0.06%	0.04%	72	2.22%	1.79%
33	0.07%	0.04%	73	2.47%	1.98%
34	0.07%	0.05%	74	2.76%	2.20%
35	0.08%	0.05%	75	3.08%	2.43%
36	0.09%	0.05%	76	3.43%	2.68%
37	0.09%	0.06%	77	3.81%	2.95%
38	0.10%	0.06%	78	4.24%	3.25%
39	0.11%	0.07%	79	4.71%	3.59%
40	0.11%	0.07%	80	5.23%	3.96%
41	0.12%	0.08%	81	5.86%	4.39%
42	0.13%	0.09%	82	6.54%	4.86%
43	0.13%	0.10%	83	7.29%	5.40%
44	0.14%	0.11%	84	8.11%	6.01%
45	0.16%	0.12%	85	9.01%	6.69%
46	0.17%	0.13%	86	9.98%	7.46%
47	0.18%	0.14%	87	11.29%	8.32%
48	0.19%	0.15%	88	12.75%	9.27%
49	0.21%	0.16%	89	14.38%	10.30%
50	0.22%	0.17%	90	16.17%	11.61%
51	0.25%	0.19%	91	17.97%	13.01%
52	0.28%	0.21%	92	19.89%	14.47%
53	0.30%	0.23%	93	21.89%	15.97%
54	0.33%	0.25%	94	23.96%	17.47%
55	0.38%	0.27%	95	26.09%	18.97%
56	0.44%	0.30%	96	28.25%	20.44%
57	0.48%	0.33%	97	30.44%	21.85%
58	0.52%	0.37%	98	32.01%	22.74%
59	0.58%	0.41%	99	34.20%	23.97%
			100	35.69%	24.60%

* For purposes of disabled post-retirement mortality these rates are set forward 10 years.