CITY OF CARTHAGE, MISSOURI
POLICEMEN'S AND FIREMEN'S
PENSION PLAN

ACTUARIAL COST STATEMENT FOR
REDUCING NORMAL RETIREMENT AGE TO 55

August 2016

CBIZ Cottonwood

CBIZ Retirement Plan Services

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August 26, 2016

Pension Committee
Policemen's and Firemen's Pension Plan
City of Carthage
326 Grant
Carthage, MO 64836

Dear Committee Members:

This report contains the information required to support the change in normal retirement age from age 58 to 55 for the City of Carthage, Missouri Policemen's and Firemen's Pension Plan.

This report has been conducted in accordance with generally accepted actuarial principles and practices. The employee data was provided by the City as of January 1, 2016 and the Plan asset data was provided by BMO Harris Bank N.A. This data has been reviewed for reasonableness, but no attempt has been made to audit such information. The valuation was based on the provisions of the Plan as amended through the beginning of the Plan Year. Certain actuarial assumptions, including interest rates, mortality tables and others identified in this report, are prescribed by regulation or statute. In our opinion, the remaining actuarial assumptions used in this valuation are reasonably related to the past experience of the Plan and represent reasonable expectations of future experience under the Plan.

We are available to answer questions on our report, or to provide explanations or further details as may be requested. The undersigned credentialed actuary meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest, that would impair the objectivity of our work.

Respectfully submitted,

CBIZ Cottonwood

By Daniel P. Nichols

Daniel P. Nichols, F.S.A.
Enrollment Number 14-03073

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SECTION I

COST STUDY RESULTS

SUMMARY OF ACTUARIAL CONTRIBUTION REQUIREMENT

		Current Normal Retirement Age 58	Amended Normal Retirement Age 55
1.	Normal Cost Component of Contribution		
	a. Normal Cost	$ 209,273	$ 222,382
	b. Participating Payroll (under NRA)	$1,891,197	$1,736,564
	c. Normal Cost Rate (1a div. 1b)	11.07%	12.81%
2.	Unfunded Actuarial Accrued Liability	$2,095,316	$2,628,674
3.	Payment on Unfunded Actuarial Accrued Liability – 30 Yr. Funding	157,807	197,977
4.	Required Contribution (Normal Cost Plus Payment on UAAL)	$ 367,080	$ 420,359
5.	Interest to end of calendar year	25,696	29,425
6.	Total Required Contribution with interest	$ 392,776	$ 449,784
7.	Total Required Contribution with interest as a % of Participating Payroll (under NRA)	22.62%	25.90%
8.	Total Required Contribution with interest as a % of Participating Payroll (All EEs)	19.51%	22.34%

Each year the City of Carthage contributes the total contribution rate as shown on line 8 above. The current plan contribution rate for the fiscal year ending in 2016 was 18.70% and the City of Carthage made this contribution through the month of June 2016.

The higher contribution rates in the right-hand column are required in order to support the proposed change in normal retirement age. As long as the higher contribution amounts are made to the plan, the proposed change will not impair the ability of the plan to meet its benefit obligations that were in effect at the time the change is made.

STATEMENT OF NET ASSETS

DECEMBER 31, 2015

ASSETS

Common Stocks	$2,795,422.12	(46.3%)
Fixed Income Securities	2,976,991.29	(45.4%)
Convertible Securities	375,304.57	(6.1%)
Cash & Equivalents	154,623.45	(2.2%)
Total Investments	$6,302,341.43	
Contribution Receivable	0.00	
Accrued Income	35,179.21	
Total Assets	$6,337,520.64	

LIABILITIES

Accrued Expenses and Benefits Payable	(15,167.80)

NET ASSETS	$6,322,352.84

DEVELOPMENT OF ACTUARIAL ASSET VALUE

Market Value of Assets On:	01/01/2015		6,508,548
Change in Assets for the Period:			
January 1, 2015 - December 31, 2015			
a. Contributions		373,826	
b. Benefit Payments		560,011	
c. Expenses		63,937	
d. Investment Income			
(using assumed 7% rate of return)			
1. Beginning Asset Value		455,598	
2. Contributions		1,692	
3. Benefit Payments		20,326	
4. Expenses		1,686	
Total (1+2-3-4)		445,278	
Net Expected Increase in Assets (a-b-c+d):			195,156
Expected Assets as of:	01/01/2016		6,703,704
Actual Market Value as of:	01/01/2016		6,322,353

Adjustment to Determine Valuation Assets

Date	Market Value	Expected Market Value	Asset Gain/(Loss)	% Deferred	Deferred Gain/(Loss)
01/01/09	5,080,400	6,411,576	(1,331,176)	20%	(266,235)
01/01/13	5,685,391	5,737,871	(52,480)	20%	(10,496)
01/01/14	6,307,065	5,949,588	357,477	40%	142,991
01/01/15	6,508,548	6,606,133	(97,585)	60%	(58,551)
01/01/16	6,322,353	6,703,704	(381,351)	80%	(305,081)

Total Deferred Gain/(Loss)	(497,372)
Actuarial Value = Market Value on 1/1/2016 **Minus Total Deferred Gain/(Loss)**	6,819,725

FUNDED RATIO

		Current Normal Retirement Age 58	Revised Normal Retirement Age 55
1.	Actuarial Accrued Liability – 1/1/2016	$8,915,041	$9,448,399
2.	Actuarial Value of Assets – 1/1/2016	$6,819,725	$6,819,725
3.	Market Value of Assets - 1/1/2016	$6,322,353	$6,322,353
4.	Funded Ratio - 1/1/2016	76.50%	72.18%

Projected Cost Impact of Plan Amendment Reducing Normal Retirement Age from 58 to 55

Before Change in Normal Retirement Age	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Projected Contribution - $ Amount	392,776	416,903	438,455	453,576	472,007	478,525	485,285	492,305	489,992	496,761
Projected Contribution - % of Pay	19.51%	20.65%	21.24%	21.48%	21.90%	21.52%	21.15%	20.78%	20.03%	19.81%
Actuarial Asset Value	6,819,725	6,903,741	7,002,100	7,173,600	7,387,751	7,719,946	8,108,631	8,574,351	9,092,714	9,633,923
Market Value of Assets	6,322,353	6,574,273	6,830,043	7,097,330	7,387,751	7,719,946	8,108,631	8,574,351	9,092,714	9,633,923
Actuarial Accrued Liability	8,915,041	9,167,055	9,408,312	9,647,074	9,899,765	10,186,884	10,529,377	10,947,882	11,418,526	11,911,352
Funded Ratio	76.50%	75.31%	74.42%	74.36%	74.63%	75.78%	77.01%	78.32%	79.63%	80.88%
Unfunded Actuarial Accrued Liability	2,095,316	2,263,314	2,406,212	2,473,474	2,512,014	2,466,938	2,420,746	2,373,531	2,325,812	2,277,429

After Change in Normal Retirement Age	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Projected Contribution - $ Amount	449,784	501,492	522,689	538,184	551,804	548,546	554,929	569,482	567,850	546,030
Projected Contribution - % of Pay	22.34%	25.50%	25.79%	25.76%	25.60%	24.67%	24.36%	24.42%	23.58%	21.97%
Actuarial Asset Value	6,819,725	6,859,672	6,964,084	7,174,249	7,466,484	7,877,468	8,315,382	8,801,384	9,349,493	9,941,762
Market Value of Assets	6,322,353	6,530,204	6,792,027	7,097,979	7,466,484	7,877,468	8,315,382	8,801,384	9,349,493	9,941,762
Actuarial Accrued Liability	9,448,399	9,650,162	9,890,931	10,161,874	10,486,605	10,847,130	11,234,022	11,668,288	12,164,100	12,703,889
Funded Ratio	72.18%	71.08%	70.41%	70.60%	71.20%	72.62%	74.02%	75.43%	76.86%	78.26%
Unfunded Actuarial Accrued Liability	2,628,674	2,790,490	2,926,847	2,987,625	3,020,121	2,969,662	2,918,640	2,866,904	2,814,607	2,762,127
Additional Actuarial Accrued Liability	533,358	483,107	482,619	514,800	586,840	660,246	704,645	720,406	745,574	792,537
Additional Actuarial Asset Value	0	-44,069	-38,016	649	78,733	157,522	206,751	227,033	256,779	307,839
Additional Unfunded Actuarial Liability	533,358	527,176	520,635	514,151	508,107	502,724	497,894	493,373	488,795	484,698

SECTION II

ACTUARIAL BASIS

ACTUARIAL ASSUMPTIONS

Interest - 7% per annum

Mortality - RP-2014 Total Mortality Tables, projected generationally with MP-2015 projection scale, adjusted to reflect the 2015 Social Security Intermediate Actuarial Assumptions

Retirement - Participants are assumed to retire at the later of attained age or the plan's normal retirement age.

Turnover - Based on rates from the Actuary's Pension Handbook, Table T-2 plus incidence of disability based on the 1974 Railroad Retirement Board disability table. Sample rates are as follows:

Age	Rate of Turnover
25	5.3017%
30	5.0822%
35	4.7184%
40	3.5735%
45	1.8986%
50	.6748%
55	.4900%

Expenses - None. It is assumed that the interest assumption is net of all plan expenses.

Salary Scale - Current salary is assumed to increase by 3.5% per annum.

Assets - Market value of assets adjusted by percentage of investment gains and losses over a five-year period. The percentage starts at 80% in the first year following the investment gain or loss, decreasing by 20% for each additional year. The 2008 investment loss is being recognized over a ten-year period due to the unusual circumstances surrounding the 2008 economy/investment market.

Actuarial Funding Method

Entry Age Normal Cost Method With Unfunded Liability

Under the entry age normal cost method, the Normal Cost is computed as the level percentage of pay which, if paid from the earliest time each employee would have been eligible to join the Plan if it then existed (thus, entry age) until his retirement or termination, would accumulate with interest at the rate assumed in the valuation to a fund sufficient to pay all benefits under the Plan.

When a Plan is established after the company has been in existence for some time, the Actuarial Accrued Liability under this method, at the Plan's inception date, is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years. The Unfunded Actuarial Accrued Liability represents the difference between the Actuarial Accrued Liability and the Plan's assets.

In subsequent years, the unfunded actuarial accrued liability is reduced by the value of contributions made to the plan that are in excess of the plan's normal cost. In addition, the unfunded actuarial accrued liability is adjusted to reflect experience gains and losses that occur due to actual plan experience deviating from the actuarial assumptions.

SUMMARY OF MAJOR PLAN PROVISIONS

Eligibility -	Each policeman or fireman whose customary employment is for at least 1,000 hours per year is eligible to become a participant on his date of hire.
Average Monthly Earnings -	Highest average of any five consecutive Plan year's total earnings.
Retirement -	Prior to June 28, 2016, the Plan's normal retirement age was 58. The normal retirement age was reduced to 55 effective June 28, 2016. The retirement benefit is equal to 2.5% of average monthly earnings multiplied by years of service up to 20 years plus 1% of average monthly earnings multiplied by years of service credited from 20 to 35 years.
Early Retirement -	A person is eligible for early retirement after attaining age 50 with 15 years of service. The benefit payable immediately is the accrued benefit reduced 5% for each year that the benefit commencement date precedes normal retirement date.
Disability -	Benefit is vested accrued benefit deferred to normal retirement date, i.e., the participant is treated like a terminated participant.
Death -	A deferred benefit payable at earliest retirement date equal to the amount the beneficiary would have received had the participant retired and chosen a 100% survivor benefit.
Termination -	The participant is eligible for a portion of his accrued benefit beginning at normal retirement date if he has five or more years of service. The portion is determined by the following table.

Years of Service	Vested Percentage
5	30%
6	40%
7	50%
8	60%
9	80%
10	100%

EE Contributions - No employee contributions required since 7/1/88.