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Gabriel Roeder Smith & Company
Consultants & Actuaries

CITY OF TROY INCENTIVE PLAN FOR VOLUNTEER FIREFIGHTERS

30TH ANNUAL ACTUARIAL VALUATION REPORT

DECEMBER 31, 2009

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August 2, 2010

Mr. John M. Lamerato
Assistant City Manager - Finance
City of Troy
500 West Big Beaver Road
Troy, Michigan 48084

Dear John:

Submitted in this report are the results of the 30th Annual Actuarial Valuation of the assets, benefit values, reserves and contribution requirements associated with payments provided by the City of Troy Incentive Plan for Volunteer Firefighters. The valuation was based upon data, furnished by your staff, concerning financial operations and individual participants and vested former participants.

The date of the valuation was December 31, 2009.

This report was prepared by actuaries who have substantial experience valuing public employee retirement plans. To the best of our knowledge, this report is complete and accurate and the valuation was conducted in accordance with standards of practice prescribed by the Actuarial Standards Board. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

Both of the undersigned actuaries submitting this report are Members of the American Academy of Actuaries (M.A.A.A.) as indicated, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

Brad Lee Armstrong
A.S.A., E.A., M.A.A.A.

Randall J. Dziubek
A.S.A., E.A., M.A.A.A.

BLA:RJD:sc

SUMMARY OF PLAN PROVISIONS
(DECEMBER 31, 2009)

NORMAL PAYMENT CONDITIONS

Eligibility - Attainment of age 55 with 10 or more years of incentive service or 30 years of service regardless of age, or attainment of age 50 with 25 or more years of service.

Annual Amount - $518 per year of incentive service, retiring on or after January 1, 2005, $539 per year of incentive service, retiring on or after January 1, 2006, $560 per year of incentive service, retiring on or after January 1, 2007, $582 per year of incentive service, retiring on or after January 1, 2008, $605 per year of incentive service, retiring on or after January 1, 2009. Optional forms of payment include a lump sum payment of the actuarial value using valuation assumptions for interest and male mortality. Per year amount of $605 is frozen through December 31, 2011.

VESTING

Eligibility - 10 years of incentive service. Payments commence at age 60.

Annual Amount - See above.

PAYMENTS IN EVENT OF PARTICIPANT'S DEATH

Eligibility - Death of an active participant after 10 years of incentive service.

Annual Amount - Widow receives the amount computed as above but reduced to reflect a 100% joint and survivor election.

POST-RETIREMENT PAYMENT INCREASES

An ad-hoc 10% increase in each current payment was granted in 1986 and 1987.

An ad-hoc 7-1/2% increase in each current payment was granted in 1988.

An ad-hoc 7-1/2% increase in each current payment was granted in 1989, along with a prorated increase based on the difference between the actual incentive service and the twenty-five year maximum which was provided for in Ordinance No. 62.

An ad-hoc $10 per month increase in each current payment was granted in 1990 through 1994, inclusive.

An ad-hoc $5 per month increase in each current payment was granted in 1995.

An ad-hoc $15 per month increase in each current payment was granted in 1996.

An ad-hoc $10 per month increase in each current payment was granted in 1997 through 2009, inclusive.

No increases January 1, 2010 through December 31, 2011.

ACTIVE PARTICIPANTS - DECEMBER 31, 2009
BY NEAR AGE AND YEARS OF SERVICE

Near	Years of Accrued Service							Totals
Age	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.
15-19	1							1
20-24	10							10
25-29	8	6						14
30-34	10	8	7					25
35-39	7	3	2	3				15
40-44	4	4	1	2	6			17
45-49	4	7	5	5	5	2		28
50-54		1	4	10	3	1		19
55-59	2	1	1		2			6
60						1		1
63						1		1
Totals	**46**	**30**	**20**	**20**	**16**	**5**	**0**	**137**

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Group Averages:

Age: 39.8 years.
Service: 10.4 years.

Note: In addition, there are 8 members currently on leave of absence.

INACTIVE PARTICIPANTS - BY ATTAINED AGES
DECEMBER 31, 2009

Near Ages	Current Payments No.	Current Payments Annual Payments	Deferred Payments No.	Deferred Payments Annual Payments
30-34				
35-39			2	$ 15,016
40-44			3	12,945
45-49			9	40,538
50-54	5	$ 67,946	7	19,984
55-59	10	104,606	6	21,525
60-64	9	52,252		
65-69	9	54,930		
70-74	20	92,468		
75-79	9	41,206		
80+	17	64,228		
Totals	**79**	**$477,636**	**27**	**$110,008**

DEVELOPMENT OF FUNDING VALUE OF ASSETS

	Year Ended December 31,	2006	2007	2008	2009	2010	2011	2012
A.	Funding Value Beginning of Year	$ 6,571,524	$ 6,006,600	$ 6,412,626	$ 6,272,677			
B.	Market Value End of Year	5,768,679	6,245,711	6,066,814	5,362,039			
C.	Market Value Beginning of Year	6,261,583	5,768,679	6,245,711	6,066,814			
D.	Non Investment Net Cash Flow# (EE + ER cont.) - (Ret. Ben.+Refunds+Admin. Exp.)	(785,379)	127,423	(375,392)	(1,273,689)			
E.	Investment Income							
E1.	Market Total: B - C - D	292,475	349,609	196,495	568,914			
E2.	Assumed Rate	6.50%	6.50%	6.50%	6.50%			
E3.	Amount for Immediate Recognition	401,624	394,570	404,620	366,329			
E4.	Amount for Phased-In Recognition	(109,149)	(44,961)	(208,125)	202,585			
F.	Phased-In Recognition of Investment Income							
F1.	Current Year: 0.25 x E4	(27,287)	(11,240)	(52,031)	50,646			
F2.	First Prior Year	(78,620)	(27,287)	(11,240)	(52,031)	$ 50,646		
F3.	Second Prior Year	1,181	(78,620)	(27,287)	(11,240)	(52,031)	$ 50,646	
F4.	Third Prior Year	(76,443)	1,180	(78,619)	(27,288)	(11,241)	(52,032)	$ 50,647
F5.	Total Recognized Investment Gain/(Loss)	(181,169)	(115,967)	(169,177)	(39,913)	(12,626)	(1,386)	50,647
G.	Funding Value: A + D + E3 + F5	6,006,600	6,412,626	6,272,677	5,325,404			
H.	Difference Between Market & Funding Values	(237,921)	(166,915)	(205,863)	36,635			
I.	Recognized Rate of Return	3.6%	4.6%	3.8%	5.8%			

Net of investment expenses.

The Funding Value of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased-in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. The Funding Value of Assets is **unbiased** with respect to Market Value. At any time it may be either greater or less than Market Value. If actual and assumed rates of investment income are exactly equal for 3 consecutive years, the Funding Value will become equal to Market Value.

DEVELOPMENT OF UNFUNDED ACTUARIAL ACCRUED LIABILITIES AS OF DECEMBER 31, 2009

Actuarial Accrued Liabilities For:	
Active Participants*	$ 7,215,834
Inactive Participants	
Current payments	4,818,038
Deferred payments	591,371
Total Actuarial Accrued Liabilities	12,625,243
Funding Value of Assets	5,325,404
Unfunded Actuarial Accrued Liabilities	**$7,299,839**

* *Includes participants on leave of absence.*

MARKET VALUE INCOME STATEMENT FOR CALENDAR YEAR 2009

Plan Assets at Beginning of Year	$ 6,066,814
plus Employer Contributions	864,167
plus Investment Income	568,914
less Monthly Retirement Benefits	595,735
less Lump Sum Retirement Benefits	1,535,569
less Administrative Expenses	6,552
Plan Assets at End of Year	$ 5,362,039

City's Computed Contribution for the Fiscal Year Beginning July 1, 2010

Contribution for:

NORMAL COST	
Age and service payments	$ 275,031
Death-in-service payments	18,854
Total	293,885
UNFUNDED ACCRUED LIABILITIES	
Present recipients	0
Active participants and vested former participants*	579,806
Total	579,806
CITY'S TOTAL CONTRIBUTION	**$ 873,691**

* *Financed over an open period of 25 years.*

Comment A: This Plan has a history of benefit increases and allows lump sums to be paid at retirement. The total contribution shown above does not reflect recognition of potential future increases in benefits beyond 2011. A funding policy of recognizing pension increases as they happen will usually lead to persistent annual increases in the computed contribution requirement and persistent decreases in the funded ratio. In the case of this Plan that has a popular lump sum option, this can also lead to negative cash flows which could exhaust the Plan Assets in less than 10 years. This would drive contributions to the level of expenditures, which would create extreme volatility and on average, much higher contributions.

Comment B: The Plan's current assumed investment return assumption of 6.5% can be considered aggressive since the Plan is primarily invested in fixed income instruments. The Plan has averaged about 4.5% over the last four years. We recommend a review of the Plan's investment policy with a focus on asset allocation.

DERIVATION OF ACTUARIAL GAIN (LOSS)
PENSION BENEFITS
YEAR ENDED DECEMBER 31, 2009

1)	UAAL at start of year	$ 6,765,166
2)	Normal cost	326,829
3)	Actual employer contributions	864,167
4)	Interest accrual	422,272
5)	Expected UAAL before changes	6,650,100
6)	Change from benefit increases#	76,413
7)	Change from revised actuarial assumptions	0
8)	Expected UAAL after changes	6,726,513
9)	Actual UAAL at end of year	7,299,839
10)	Gain (Loss) (8) - (9)	(573,326)
11)	Gain (Loss) as percent of actuarial accrued liabilities at start of year $13,037,843	(4.4)%

 # $10 per month ad-hoc COLA for current retiree's benefits.

CITY OF TROY INCENTIVE PLAN FOR VOLUNTEER FIREFIGHTERS
COMPARATIVE SCHEDULE

Valuation Date December 31,	Vested Former Participants				Accrued Liability	Actuarial Value of Assets	Percent Funded	Unfunded Accrued Liability	Computed City Contribution
	Current Payments		Deferred Payments						
	No.	Annual $	No.	Annual $					
1994 *	51	$ 136,187	22	$ 39,750	$ 3,749,683	$ 3,236,057	86.3 %	$ 513,626	$ 171,556
1995	54	145,049	21	40,587	4,393,900	3,512,240	79.9	881,660	216,567
1996 *	56	163,321	21	44,897	4,935,993	3,761,590	76.2	1,174,403	262,950
1997 *	57	178,421	22	47,885	5,635,119	4,211,224	74.7	1,423,895	301,412
1998 *	58	182,869	24	59,570	6,034,103	4,680,711	77.6	1,353,392	304,480
1999 *#	58	189,829	24	59,570	6,789,910	5,051,720	74.4	1,738,190	349,404
2000 *	60	201,427	27	73,879	7,397,365	5,137,078	69.4	2,260,287	413,432
2001 *	62	225,030	28	79,743	8,160,180	5,109,422	62.6	3,050,758	512,973
2002 *	61	232,881	28	86,384	9,598,244	5,720,336	59.6	3,877,908	623,348
2003 *	63	246,090	26	79,680	11,786,697	6,083,672	51.6	5,703,025	795,904
2004 *	64	263,767	26	82,834	11,936,051	6,261,188	52.5	5,674,863	774,795
2005 *	67	302,477	27	92,676	12,052,272	6,571,524	54.5	5,480,748	762,121
2006 *	70	346,539	25	79,601	11,931,905	6,006,600	50.3	5,925,305	788,742
2007 *	73	372,705	23	75,828	13,239,695	6,412,626	48.4	6,827,069	885,365
2008 *	74	403,828	24	89,238	13,037,843	6,272,677	48.1	6,765,166	864,167
2009	**79**	**468,876**	**27**	**110,008**	**12,548,830**	**5,325,404**	**42.4**	**7,223,426**	**867,621**
2009 *	**79**	**477,636**	**27**	**110,008**	**12,625,243**	**5,325,404**	**42.2**	**7,299,839**	**873,691**

* *After changes in benefit provisions.*
\# *After changes in actuarial assumptions.*

COMMENT: It is the actuary's opinion that the required contribution amounts determined by the most recent actuarial valuation are sufficient to meet the System's financial objective, presuming continued timely receipt of required contributions when due, and no changes in benefit provisions.

VALUATION ASSUMPTIONS

The **entry-age normal cost valuation method** was used in determining payment liabilities and costs.

The **interest rate** used in making the valuation was 6.5% per annum, compounded annually. This rate was first used for the December 31, 1999 valuation.

The **mortality table** used was the 1983 Group Annuity Mortality Table. This table was first used for the December 31, 1999 valuation.

	Single Life Values			
	Present Value of $1 Monthly for Life		Future Life Expectancy (Years)	
Sample Ages	Men	Women	Men	Women
50	$151.83	$163.46	29.18	34.92
55	141.54	155.23	24.82	30.24
60	129.07	144.87	20.64	25.67
65	114.32	132.18	16.69	21.29
70	98.49	116.95	13.18	17.13
75	82.32	100.05	10.15	13.37
80	66.65	83.11	7.64	10.20

Probabilities of retirement for members eligible for immediate incentive payments were:

Ages	Percent of Eligible Active Participants Separating Within Next Year
48	20%
49	20
50	20
51	20
52	20
53	20
54	20
55	20
56	20
57	20
58	20
59	15
60	15
61	15
62	25
63	100

Sample Rates of Separation From Active Employment Before Age 55

Sample Ages	Years of Service	% of Active Participants Separating Within Next Year
ALL	1	15.00 %
	2	10.00
	3	8.00
	4	7.00
	5	6.00
25	5 & Over	5.00
30		4.50
35		3.55
40		1.45
45		0.75
50		0.75

SUMMARY OF ASSUMPTIONS USED
DECEMBER 31, 2009

Pensions in an Inflationary Environment

VALUE OF $1,000/MONTH RETIREMENT BENEFIT TO AN INDIVIDUAL WHO RETIRES AT AGE 55 IN AN ENVIRONMENT OF 4.00% INFLATION

Age	Value
55	$1,000
56	962
57	925
58	889
59	855
60	822
65	676
70	556
75	457
80	375

The life expectancy of a 55 year old male retiree is age 80. The life expectancy for a 55 year old female retiree is age 85. Half of the people will outlive their life expectancy. The effects of even moderate amounts of inflation can be significant for those who live to an advanced age.

SUMMARY OF ASSUMPTIONS USED
MISCELLANEOUS AND TECHNICAL ASSUMPTIONS
DECEMBER 31, 2009

Marriage Assumption. 100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits.

Pay Increase Timing. Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

Decrement Timing. Decrements of all types are assumed to occur mid-year.

Eligibility Testing. Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

Benefit Service. Exact fractional service is used to determine the amount of benefit payable.

Decrement Relativity. Decrement rates are used without adjustment for multiple decrement table effects.

Decrement Operation. Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal do not operate during retirement eligibility.

Normal Form of Benefit. The assumed normal form of benefit is the straight life form.

Optional Forms of Payment. 6.5% interest, 1983 Group Annuity male mortality for members and 1983 Group Annuity female mortality for beneficiaries.

Incidence of Contributions. Contributions are assumed to be received continuously throughout the year based upon the computed dollar amounts shown in this report. New entrant normal cost contributions are applied to the funding of new entrant benefits.

ACTUARIAL ACCRUED LIABILITY

The actuarial accrued liability is a measure intended to help users assess (i) a pension fund's funded status on a going concern basis, and (ii) progress being made toward accumulating the assets needed to pay benefits as due. Allocation of the actuarial present value of projected benefits between past and future service was based on service using the individual entry-age actuarial cost method. Assumptions, were the same as used to determine the Plan's level dollar annual required contribution between entry-age and assumed exit age. Entry-age was established by subtracting credited service from current age on the valuation date.

The preceding methods comply with the financial reporting standards established by the Governmental Accounting Standards Board.

The entry age actuarial accrued liability was determined as part of an actuarial valuation of the Plan as of December 31, 2009. Significant actuarial assumptions used in determining the actuarial accrued liability include (a) a rate of return on the investment of present and future assets of 6.5% per year compounded annually, and (b) the assumption that benefits will not increase after retirement.

Actuarial Accrued Liability	
Active members*	$ 7,215,834
Retired members and beneficiaries currently receiving benefits	4,818,038
Vested terminated members not yet receiving benefits	591,371
Total Actuarial Accrued Liability	12,625,243
Actuarial Value of Assets (market value was $5,362,039)	5,325,404
Unfunded Actuarial Accrued Liability	$ 7,299,839

* *Including members on leave of absence.*

During the year ended December 31, 2009, the Plan experienced a net change of ($412,600) in the actuarial accrued liability, of which $76,413 was attributable to changes in benefit provisions. There were no changes in actuarial assumptions during the year.

REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULE OF FUNDING PROGRESS
($ AMOUNTS IN THOUSANDS)

Actuarial Valuation Date December 31,	Actuarial Value of Assets# (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b)-(a)	Funded Ratio (a)/(b)
1995 *	$3,512	$ 4,394	$ 882	79.9 %
1996 *	3,816	4,936	1,120	77.3
1997 *	4,211	5,635	1,424	74.7
1998	4,681	6,034	1,353	77.6
1999 *&	5,052	6,790	1,738	74.4
2000 *	5,137	7,397	2,260	69.4
2001 *	5,109	8,160	3,051	62.6
2002 *	5,720	9,598	3,878	59.6
2003 *	6,084	11,787	5,703	51.6
2004 *	6,261	11,936	5,675	52.5
2005 *	6,572	12,052	5,481	54.5
2006 *	6,007	11,932	5,925	50.3
2007 *	6,413	13,240	6,827	48.4
2008 *	6,273	13,038	6,765	48.1
2009 *	**5,325**	**12,625**	**7,300**	**42.2**

\# *Prior to 1996, Book Value was used.*
* *After changes in benefit provisions.*
& *After changes in actuarial assumptions.*

Analysis of the dollar amounts of actuarial value of assets, actuarial accrued liability, or actuarial accrued liability in isolation can be misleading. Expressing the actuarial value of assets as a percentage of the actuarial accrued liability provides one indication of the system's funded status on a going-concern basis. Analysis of this percentage over time indicates whether the system is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan. The unfunded actuarial accrued liability and annual covered payroll are both affected by inflation.

REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULE OF EMPLOYER CONTRIBUTIONS

Fiscal Year Ending June 30,	Actuarial Valuation Date December 31,	Annual Required Contribution (In thousands)	Percent Contributed
1995	1993	$139	100 %
1996	1994	172	100
1997	1995	217	100
1998	1996	263	100
1999	1997	320	100
2000	1998	330	100
2001	1999	360	100
2002	2000	413	100
2003	2001	513	100
2004	2002	623	100
2005	2003	796	100
2006	2004	775	105
2007	2005	762	104
2008	2006	789	101
2009	2007	885	100
2010	**2008**	**864**	**100**

NOTES TO REQUIRED SUPPLEMENTARY INFORMATION
SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date	12/31/2009
Actuarial Cost Method	Individual Entry Age
Amortization Method	Level dollar, open
Remaining Amortization Period	25 years
Asset Valuation Method	4-year smoothed market
Actuarial Assumptions:	
Investment Rate of Return	6.50%
Projected Salary Increases	N/A