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GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

CITY OF TROY EMPLOYEES RETIREMENT SYSTEM

FORTY-SEVENTH ANNUAL ACTUARIAL VALUATION

DECEMBER 31, 2010

OUTLINE OF CONTENTS

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October 25, 2011

The Board of Trustees
City of Troy Employees Retirement System
Troy, Michigan

Submitted in this report are the results of the 47th Annual Actuarial Valuation of the assets, benefit values, reserves and contribution requirements associated with payments provided by the City of Troy Employees Retirement System. The valuation was based upon data, furnished by your staff, concerning financial operations and individual participants and vested former participants. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information.

The purpose of the valuation is to measure the System's funding progress, to determine the employer contribution rate for the fiscal year ending June 30, 2012, and to determine the actuarial information for Governmental Accounting Standards Board (GASB) Statement No. 25 and No. 27. The date of the valuation was December 31, 2010.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

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 undersigned actuaries submitting this report are Members of the American Academy of Actuaries (where indicated with the designation of M.A.A.A.) 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.

Kenneth G. Alberts

BLA:RJD:bd

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SECTION A

VALUATION RESULTS, COMMENTS AND CONCLUSION

COMPUTED CITY CONTRIBUTIONS
OF THE RETIREMENT SYSTEM
FOR THE FISCAL YEAR BEGINNING JULY 1, 2011

1. Actuarial Present Value of All Future Benefits*:		
- Active	$	61,231,662
- Terminated Vested	$	951,004
- Retired	$	88,664,507
- Total	$	150,847,173
2. Funding Value of Assets	$	133,400,223
3. Actuarial Present Value of Future Employee Contributions	$	1,920,579
4. City's Remaining Unfunded Present Value of Benefits After Recognition of Funding Value of Assets and Future Employee Contributions (1) - (2) - (3)	$	15,526,371
5. Actuarial Present Value of Future Salary	$	60,148,776
6. Projected Payroll 1/1/2011 - 12/31/2011#	$	8,098,572
7. City's Annual Normal Cost (4) / (5) * (6) Plus Interest at 6.5% for 6 Months	$	2,157,379

* *An actuarial present value is the present day value of a payment or series of payments that may become payable in the future. To determine an actuarial present value you need to use assumptions for the probability a payment will be paid, in what amount, and when. The probability the payment will be paid is determined by the eligibility provisions and the demographic assumptions for rates of withdrawal, disability, death, and retirement. The amount is determined by the benefit formula and assumptions for salary increases. The "when" determines how long an investment today would earn investment return before it needs to be paid. For example, if the probability of $1,000 being paid in 10 years is 75% and assumed investment return is 6.5%/year, the actuarial present value is* $\$1{,}000 \times 75\% / (1.065)^{10} = \$400$.

\# *Projected payroll reflects only those active employees covered by the closed Retirement System. This amount is expected to decline in the future until all active employees have terminated/retired, at which point it will be $0. Note, the relationship between computed City contributions and payroll will become less and less meaningful each year.*

COMPUTED CITY PENSION CONTRIBUTIONS
COMPARATIVE STATEMENT

Fiscal Year Beginning July 1	Valuation Date December 31	% of Payroll Contributions General	% of Payroll Contributions Public Safety	Valuation Payroll
1985	1984 *	13.49 %	19.23 %	$ 10,518,429
1986	1985	13.29	18.75	11,373,793
1987	1986	11.42	17.59	12,048,592
1987	1986 *	13.67	17.59	12,048,592
1988	1987	12.00	14.76	13,083,451
1988	1987 *	14.91	16.34	13,083,451
1989	1988	14.69	15.98	14,162,413
1990	1989	12.93	13.72	14,774,001
1990	1989 *	13.11	19.39	14,774,001
1991	1990	13.09	19.44	16,105,129
1991	1990 *	13.09	22.99	16,105,129
1992	1991	11.65	21.21	17,323,677
1993	1992	10.02	17.82	17,619,701
1994	1993	7.64	15.07	18,518,880
1994	1993 *	9.24	20.09	18,518,880
1995	1994	8.00	18.62	17,598,618
1996	1995 *	7.23	16.23	19,039,969
1997	1996	3.66	13.40	20,535,959
1998	1997	0.00	9.15	16,133,023
1998	1997 *	0.00	10.99	16,133,023
1999	1998	3.73	0.04	16,201,219
1999	1998 *	4.30	0.04	16,201,219
1999	1999	0.00	0.00	15,056,554
1999	1999 *	0.05	0.00	15,056,554
2000	2000	0.00	0.00	15,441,200
2000	2000 *@	0.00	0.00	15,441,200
2001	2001	0.00	0.00	14,566,460
2001	2001 *	0.00	0.00	14,566,460
2002	2002	1.69	0.00	13,552,549
2003	2003	1.87	0.00	13,052,713
2004	2004	3.64	0.00	12,572,374
2005	2005	4.97	0.00	12,099,631
2006	2006 *	1.79	1.79	11,471,511
2007	2007 *	4.10	4.10	11,045,745
2008	2008	13.57	13.57	10,953,297
2009	2009	26.62	26.62	10,483,020
2010	**2010**	**27.16**	**27.16**	**8,959,340**

* *After changes in benefit provisions/cost method/actuarial assumptions.*

@ *After change in asset valuation method.*

COMMENTS AND CONCLUSION

COMMENT A: For the plan year ended December 31, 2010, the System generated a $1,861,868 experience gain. This gain is primarily the result of a larger actuarial gain due to reported pays being lower than expected based on last year's reported pays. The majority of individuals experienced a pay decrease from the prior year. The actuarial gains related to pays were offset by investment losses due to continued recognition of calendar year 2008 investment performance. Based on the method adopted by the Board used to determine the funding value of assets, and past investment experience, the expected future recognition of investment gains and losses is expected to put upward pressure on required contributions over the next two years, and downward pressure on required contributions for the following two years (absent additional investment gains or losses over that period). We recommend the Board review this method and combine the unrecognized investment performance for the four year period ending December 31, 2010. This will moderate expected contribution changes over the next four years if actual experience during that time is close to what is being assumed. An illustration of these proposed changes is included on page B-5.

COMMENT B: The required City contribution has decreased from last year primarily due to favorable experience regarding pays of active members (as discussed in Comment A above). The current actuarial cost method used to determine required City contributions, recognizes the actuarial gains generated from this favorable pay experience over the expected future salaries of active employees.

COMMENT C: There have been a significant number of retirements after the valuation date in connection with Early Retirement Incentive Programs (ERIP). The city has studied the overall affect of the ERIP over the next 5 years and has forecasted that it will result in an overall cost savings to the City. GRS has reviewed the City's methodology and agrees with it (see letter dated 8/18/2011). Therefore, although the present value of benefits are anticipated to increase as a result of the ERIP based on our prior analyses focusing primarily on the Retirement System, the payroll and fringe benefit savings must be considered in any future assessments of the overall impact of the ERIP on the City's finances.

CONCLUSION: It is the actuary's opinion that the required contribution rate determined by the most recent actuarial valuation is sufficient to meet the Retirement System's funding objective. In addition, to ensure that the Retirement System maintains the ability to pay retiree benefits when due, and to reduce the likelihood of future required contribution amounts increasing from the current level, continued timely receipt of annual computed contributions is essential.

DERIVATION OF ACTUARIAL GAIN (LOSS)
YEAR ENDED DECEMBER 31, 2010

The actuarial gains or losses realized in the operation of the Retirement System provide an experience test. Gains and losses are expected to cancel each other over a period of years (in the absence of double-digit inflation) and sizable year to year fluctuations are common. Detail on the derivation of the actuarial gain (loss) is shown below, along with a year by year comparative schedule.

(1)	UPVFB* at start of year	$ 18,497,046
(2)	Employer and employee contributions	2,238,368
(3)	Estimated reserve transfers	0
(4)	Interest accrual	1,129,561
(5)	Expected UPVFB before changes: (1) - (2) + (3) + (4)	17,388,239
(6)	Change from revised benefit provisions	0
(7)	Change from revised actuarial assumptions	0
(8)	Expected UPVFB after changes: (5) + (6) + (7)	17,388,239
(9)	Actual UPVFB at end of year	15,526,371
(10)	Gain (loss): (8) - (9)	$ 1,861,868
(11)	Gain (loss) as percent of present value of future benefit at start of year	1.2%

** Unfunded Present Value of Future Benefits. This is the present value of future benefits less the actuarial value of assets.*

Valuation Date December 31	Actuarial Gain (Loss) As % of Beginning UPVFB*
2001	3.3 %
2002	(3.2)
2003	1.6
2004	(3.7)
2005	(0.7)
2006	(0.6)
2007	0.3
2008	(5.2)
2009	(6.0)
2010	**1.2**

** Prior to 2007 this exhibit shows Actuarial Gain (Loss) as a % of Beginning Actuarial Accrued Liabilities.*

SECTION B

SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA SUBMITTED BY THE RETIREMENT SYSTEM

BENEFIT PROVISIONS EVALUATED AND/OR CONSIDERED (DECEMBER 31, 2010)

REGULAR RETIREMENT (no reduction factor for age):

Eligibility - T.P.O.A., T.F.S.O.A. and T.C.O.A. members: 25 years of service; or age 60 with 10 years of service. General AFSCME, General Clerical Members, Classified or Exempt: Age 50 with 27 years of service; or age 55 with 25 years of service; or age 60 with 10 years of service.

Mandatory Retirement Age - None.

Annual Amount

Division	Benefit	Supplemental Benefit
T.P.O.A.	2.80% * FAC to 25 years 1.00% * FAC 26-30 years	
T.C.O.A.	2.80% * FAC to 25 years 1.00% * FAC 26-30 years	
T.F.S.O.A.	2.25% * FAC * Service	0.25% * FAC * Service
General AFSCME	2.25% * FAC * Service	0.25% * FAC * Service
General Classified/Exempt	2.25% * FAC * Service	0.25% * FAC * Service
General Clerical	2.25% * FAC * Service	0.25% * FAC * Service

Type of Final Average Compensation - Highest 3 years out of last 10. Some lump sums are included but payment of sick or vacation leave is not included.

EARLY RETIREMENT (AGE REDUCTION FACTOR USED):

Eligibility - Age 55 with 10 years of service.

Annual Amount - Computed as regular retirement benefit but reduced by 1/2% for each month by which retirement precedes age 60.

DEFERRED RETIREMENT (vested benefits):

Eligibility - 10 years of service. Benefit payable at age 60.

Annual Amount - Same as regular retirement but based on credited service and final average compensation at termination.

DUTY DISABILITY RETIREMENT:

Eligibility - No age or service requirement. Worker's compensation must be payable.

Annual Amount - Same as regular retirement. Upon termination of worker's compensation the benefit is recomputed to grant service credit for the period in receipt of worker's compensation. Minimum benefit is based on 10 years of credited service (66-2/3% of final average compensation for non-command/exempt public safety members, while in receipt of worker's compensation).

NON-DUTY DISABILITY RETIREMENT:

Eligibility - 5 years of service (10 years for Exempt and Classified, AFSCME employees hired after 2/96).

Annual Amount - Same as regular retirement, but with a minimum benefit based on 10 years of credited service.

DUTY DEATH BEFORE RETIREMENT:

Eligibility - No age or service requirement.

Annual Amount - Widow's benefit equal to regular retirement benefit actuarially reduced in accordance with a 100% joint and survivor election. Minimum benefit is 25% (50% for T.F.S.O.A., Command Officers and T.P.O.A.) of final average compensation. If no widow, children under 18 share equally in 25% (50% for Command Officers and T.P.O.A.) of final average compensation.

NON-DUTY DEATH BEFORE RETIREMENT:

Eligibility - 10 years service.

Annual Amount - Same as regular retirement but reduced in accordance with a 100% joint and survivor election.

AUTOMATIC DEATH BENEFIT AFTER RETIREMENT: NONE.

POST-RETIREMENT ADJUSTMENTS: One-time increases were granted in 1973, 1977, 1978, 1981, 1983, 1989 and 1999.

HEALTH INSURANCE PREMIUM SUBSIDY: Post-retirement health insurance premiums are subsidized by the City as follows:

T.C.O.A. - Fully paid after 7/1/94.
T.P.O.A. - 4% per complete year, retired after 2/20/1996.
T.F.S.O.A.- 4% per complete year, retired after 1/1/99.
AFSCME - 4% per complete year, retired after 1/1/01.
Classified Exempt, Clerical - $400/month or 4% per complete year, whichever is greater.
Retirees from prior provisions - $400/month or 3% per complete year, whichever is greater.

MEMBER CONTRIBUTIONS: Expressed as percentages of compensation as follows:

1.5% for clerical members
3.0% for T.F.S.O.A.
1.5% for classified and Exempt members
1.5% for AFSCME
4.0% for T.P.O.A.
4.0% for T.C.O.A.

REPORTED FUND BALANCE (MARKET VALUE)

Reserves	Reported Fund Balance December 31, 2010	2009
Reserve for Employees' Contributions	$ 3,446,321	$ 3,332,743
Reserve for Employer Contributions	96,935,023	86,254,937
Reserve for Retired Benefit Payments	34,009,886	31,243,483
Reserve for Undistributed Investment Income	0	0
Reserve for Health Insurance Premiums	38,669,579	38,319,430
Total Fund Balance	$173,060,809	$159,150,593

Valuation assets are equal to reported market value of assets (excluding health reserves), except that all realized and unrealized gains and losses are spread over a period of years, with 20% recognition the first year. Such spreading reduces the fluctuation in the City's computed contribution rate which might otherwise be caused by market value fluctuations. The details of the spreading technique are shown on page B-4. The valuation assets as of December 31, 2010 total $133,400,223.

In financing actuarial accrued liabilities, valuation assets of $133,400,223 were distributed as follows:

Reserves for	Valuation Assets Applied to Actuarial Accrued Liabilities for: Active Members	Retirants & Beneficiaries	Contingency Reserve	Totals
Employees' Contributions	$ 3,446,321			$ 3,446,321
Employer Contributions	96,935,023			96,935,023
Retired Benefit Payments		$ 34,009,886		34,009,886
Valuation Asset Adjustment	(991,007)			(991,007)
Totals	**$99,390,337**	**$ 34,009,886**		**$133,400,223**

DERIVATION OF VALUATION ASSETS
MARKET VALUE WITH 20% RECOGNITION OF THE DIFFERENCE BETWEEN THE MARKET RATE OF RETURN AND THE PROJECTED RATE OF RETURN

	2009	2010	2011	2012	2013	2014
A. Funding Value Beginning of Year	$ 128,248,730	$ 132,464,823				
B. Market Value End of Year	120,831,163	134,391,230				
C. Market Value Beginning of Year	97,312,156	120,831,163				
D. Non-Investment Net Cash Flow (EE + ER cont.) - (Ret Ben. + Refunds + Adm. exp)	479,431	(5,413,479)				
E. Investment Income:						
E1. Market Total: B-C-D	23,039,576	18,973,546				
E2. Assumed Rate	6.50%	6.50%				
E3. Amount for Immediate Recognition: E2 * (A+D/2)	8,351,749	8,434,275				
E4. Amount for Phased-In Recognition: E1-E3	14,687,827	10,539,271				
F. Phased-In Recognition of Investment Income:						
F1. Current Year: 0.20*E4	2,937,565	2,107,854				
F2. First Prior Year	(8,466,090)	2,937,565	$ 2,107,854			
F3. Second Prior Year	679,073	(8,466,090)	2,937,565	$ 2,107,854		
F4. Third Prior Year	656,202	679,073	(8,466,090)	2,937,565	$ 2,107,854	
F5. Fourth Prior Year	(421,837)	656,202	679,071	(8,466,088)	2,937,567	$ 2,107,855
F6. Total Recognized Investment Gain	(4,615,087)	(2,085,396)	(2,741,600)	(3,420,669)	5,045,421	2,107,855
G. Funding Value End of Year: A+D+E3+F6	**$ 132,464,823**	**$ 133,400,223**				
H. Difference between Market & Funding Value	(11,633,660)	991,007				
I. Recognized Rate of Return	2.91%	4.89%				
J. Ratio of Funding Value to Market Value	110%	99%				

DERIVATION OF VALUATION ASSETS
MARKET VALUE WITH 20% RECOGNITION OF THE DIFFERENCE BETWEEN THE MARKET RATE OF RETURN AND THE ASSUMED RATE OF RETURN
ALTERNATE RECOGNITION OF UNRECOGNIZED GAINS/LOSSES AS OF DECEMBER 31, 2010

	2009	2010	2011	2012	2013	2014
A. Funding Value Beginning of Year	$ 128,248,730	$ 132,464,823				
B. Market Value End of Year	120,831,163	134,391,230				
C. Market Value Beginning of Year	97,312,156	120,831,163				
D. Non-Investment Net Cash Flow (EE + ER cont.) - (Ret Ben. + Refunds + Adm. exp)	479,431	(5,413,479)				
E. Investment Income:						
E1. Market Total: B-C-D	23,039,576	18,973,546				
E2. Assumed Rate	6.50%	6.50%				
E3. Amount for Immediate Recognition: E2 * (A+D/2)	8,351,749	8,434,275				
E4. Amount for Phased-In Recognition: E1-E3	14,687,827	10,539,271				
F. Phased-In Recognition of Investment Income:						
F1. Current Year: 0.20*E4	2,937,565	2,107,854				
F2. First Prior Year	(8,466,090)	2,937,565	$ 247,752			
F3. Second Prior Year	679,073	(8,466,090)	n/a	$ 247,752		
F4. Third Prior Year	656,202	679,073	n/a	n/a	$ 247,752	
F5. Fourth Prior Year	(421,837)	656,202	n/a	n/a	n/a	$ 247,751
F6. Total Recognized Investment Gain	(4,615,087)	(2,085,396)	247,752	247,752	247,752	247,751
G. Funding Value End of Year: A+D+E3+F6	**$ 132,464,823**	**$ 133,400,223**				
H. Difference between Market & Funding Value	(11,633,660)	991,007				
I. Recognized Rate of Return	2.91%	4.89%				
J. Ratio of Funding Value to Market Value	110%	99%				

ASSET INFORMATION REPORTED FOR VALUATION COMPARATIVE STATEMENT

Year Ended December 31	Revenues				Expenses				Assets Year-End *
	Employee Contrib.	Employer Contrib.	Investment Income	Misc. Income	Retirement Benefits	Contrib. Refunds	Health Insurance	Misc. Expenses	
1985	$ 1,011	$1,483,547	$ 3,952,592	$ 0	$ 349,086	$ 11,087	$ 18,268	$ 3,026	$ 25,952,007
1986	8,126	1,864,968	7,423,057	0	487,308	8,960	22,931	3,445	34,725,514
1987	1,998	1,922,529	1,264,117	0	559,647	893	32,525	4,321	37,316,772
1988	1,296	1,989,070	3,384,845	0	621,836	8,490	55,381	0	42,006,276
1989	1,490	2,259,952	7,158,731	0	712,137	19,967	60,189	9,010	50,625,146
1990	1,558	2,401,060	3,861,487	0	782,167	19,292	68,886	4,984	56,013,922
1991	1,760	3,081,239	11,116,274	0	878,775	1,431	87,281	0	69,245,708
1992	6,177	2,626,564	7,134,901	0	1,040,882	14,188	100,340	5,600	77,852,340
1993	24,939	2,647,753	7,900,961	0	1,115,225	392	119,120	6,000	87,185,256
1994	144,934	2,950,360	(187,532)	0	1,351,290	590	152,637	6,300	88,582,201
1995	198,746	3,156,148	20,889,448	0	1,819,840	14,066	220,291	6,600	110,765,746
1996	335,144	3,311,550	16,325,274	0	2,013,257	3,047	251,138	11,300	128,458,972
1997	371,811	3,167,814	25,544,354	0	2,459,287	11,273	329,312	16,404	154,726,675
1998	340,807	2,819,785	21,825,629	0	2,666,133	19,105,397	449,779	19,846	160,216,807
1999	335,828	1,795,070	12,085,389	0	2,860,935	1,095,796	481,660	28,782	167,220,855
2000	421,161	1,113,993	3,075,759	0	3,156,251	7,349,663	688,138	27,515	160,610,201
2001	398,572	1,303,079	2,162,267	0	3,351,223	6,753,854	693,345	28,998	153,646,699
2002	364,130	1,532,439	(7,992,398)	0	3,496,301	7,249,513	942,054	31,653	135,831,349
2003	343,629	1,543,286	25,064,474	0	3,843,356	10,230	1,102,076	29,334	157,797,742
2004	333,305	1,571,547	12,763,027	0	4,482,783	335,998	1,254,559	29,322	166,362,959
2005	309,731	972,454	2,995,153	0	4,923,401	2,613	1,368,331	53,247	164,292,705
2006	308,887	247,688	14,764,828	0	5,529,394	57,875	1,592,311	32,382	172,402,146
2007	315,677	218,653	15,286,055	0	5,924,256	5,516	1,855,527	47,947	180,389,285
2008	316,708	376,155	(44,700,324)	0	6,204,282	0	2,101,958	62,349	128,013,235
2009	7,651,667 #	838,969	33,216,875	0	7,944,132	0	2,558,948	67,073	159,150,593
2010	**285,047**	**1,953,321**	**22,366,478**	**0**	**7,596,953**	**0**	**3,042,783**	**54,894**	**173,060,809**

* *Includes assets for retiree health benefits.*

\# *Includes amounts moved from the City's defined contribution plan for employees choosing to transfer to the Employees Retirement System.*

SUMMARY OF
CURRENT ASSET INFORMATION *
REPORTED FOR VALUATION

Market Value of Assets

	12/31/2010 Market Value	12/31/2009 Market Value
Cash & equivalents	$ 4,781,044	$ 7,383,369
Government bonds	16,220,312	20,705,160
Corporate bonds	19,985,248	29,571,059
Stock	123,260,256	101,491,005
Bond mutual funds	8,813,949	0
Other (annuities)	0	0
Total assets	173,060,809	159,150,593
Less accounts payable	0	0
Net assets available for benefits	$173,060,809	$159,150,593

Revenues and Expenses

	2010	2009
Balance - January 1	$ 159,150,593	$ 128,013,235
Revenues		
Employees' contributions	285,047	7,651,667 #
Employer contributions	1,953,321	838,969
Investment income	22,366,478	33,216,875
Miscellaneous	0	0
Expenses		
Benefit payments	7,596,953	7,944,132
Refunds of member contributions	0	0
Administrative expenses	54,894	67,073
Health insurance premiums	3,042,783	2,558,948
Miscellaneous	0	0
Balance - December 31	$ 173,060,809	$ 159,150,593
Rate of return net of expenses	14.4%	26.2%

** Includes assets for retiree health benefits.*

 # Includes amounts moved from the City's defined contribution plan for employees choosing to transfer to the Employees Retirement System.

RECENT HISTORICAL MARKET VALUE RATES OF RETURN

Year Ending	Rate of Return	Five Year Average	Ten Year Average
2001	1.4%		
2002	-5.4%		
2003	18.7%		
2004	8.2%		
2005	1.8%	4.6%	
2006	9.2%	6.2%	
2007	9.1%	9.3%	
2008	-25.3%	-0.4%	
2009	26.2%	2.7%	
2010	14.4%	5.1%	4.9%

RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS
DEFINED BENEFIT PLAN
COMPARATIVE STATEMENT

Year Ended December 31	Added to Rolls			Removed from Rolls		Rolls End of Year		% Incr. Annual Benefit	Average Annual Benefit	Present Value of Benefits	Expected Removal
	No.	Annual Benefit	Post-Ret. Increases	No.	Annual Benefit	No.	Annual Benefit				
1986	8	$ 64,758		1	$ 3,820	71	$ 531,906	12.9%	7,492	$ 6,006,326	1.3
1987	6	45,628		3	12,295	74	565,239	6.3	7,638	6,307,514	1.6
1988	6	82,290		2	8,825	78	538,704	13.0	8,188	6,997,601	1.7
1989	6	71,518	$ 26,993	1	4,836	83	732,379	14.7	8,824	7,902,521	1.9
1990	5	102,108		2	13,370	86	821,117	12.1	9,548	8,852,756	2.1
1991	10	185,752		6	53,568	90	953,301	16.1	10,592	10,403,174	2.2
1992	10	154,697		4	41,160	96	1,066,838	11.9	11,113	11,711,334	2.4
1993	6	110,685		3	26,135	99	1,151,388	7.9	11,630	12,514,776	2.6
1994	21	648,681			(1,572)	120	1,798,497	56.2	14,987	20,491,084	2.7
1995	6	84,312		4	55,506	122	1,827,303	1.6	14,978	21,287,811	2.9
1996	20	446,833		6	60,831	136	2,213,305	21.1	16,274	25,459,651	2.0
1997	14	420,457		1	10,217	149	2,623,545	18.5	17,608	30,537,712	2.8
1998	8	163,633		4	56,055	153	2,731,123	4.1	17,850	31,402,870	3.6
1999	10	286,293		3	69,193	160	2,948,223	7.9	18,426	33,748,959	4.0
2000	11	340,403		8	59,325	163	3,229,301	9.5	19,812	37,083,835	4.0
2001	9	240,483		3	24,905	169	3,444,879	6.7	20,384	39,424,271	4.4
2002	8	189,284		6	59,479	171	3,574,684	3.8	20,905	40,667,169	4.4
2003	15	521,015		4	17,957	182	4,077,742	14.1	22,405	47,046,673	4.4
2004	21	615,572		7	87,193	196	4,606,121	13.0	23,501	53,030,527	4.8
2005	14	520,152		5	101,352	205	5,024,921	9.1	24,512	57,995,428	4.8
2006	15	609,624		3	29,746	217	5,604,799	11.5	25,829	64,573,648	4.8
2007	18	459,496		3	53,602	232	6,010,693	7.2	25,908	68,494,664	5.5
2008	11	176,381		3	30,933	240	6,156,141	2.4	25,651	69,351,765	5.8
2009	23	1,270,351		8	114,219	255	7,312,273	18.8	28,676	84,166,668	6.4
2010	**17**	**547,081**		**7**	**93,784**	**265**	**7,765,570**	**6.2**	**29,304**	**88,664,507**	**6.4**

RETIREES AND BENEFICIARIES - DECEMBER 31, 2010
TABULATED BY VALUATION DIVISIONS

DEFINED BENEFIT MEMBERS

Valuation Division	No.	Annual Benefits	Age
General	184	$ 4,140,618	69.1 years
Public Safety	81	3,624,952	62.1 years
Totals	265	$ 7,765,570	

RETIREES AND BENEFICIARIES INCLUDED IN DEFINED BENEFIT VALUATION
TABULATED BY TYPE OF BENEFITS BEING PAID
DECEMBER 31, 2010

Type of Benefits Being Paid	Number	Annual Benefits
Age and Service benefits		
Regular benefit - benefit terminating at death of retirant	77	$1,714,967
100% joint and survivor benefit		
Option A	59	2,749,310
Option C	51	1,738,716
50% joint and survivor benefits		
Option B	21	534,471
Option D	19	576,839
Survivor Beneficiary	27	329,219
Total age and service benefits	254	7,643,521
Casualty benefits		
Non-Duty Disability - Regular		
- Retiree	1	$ 12,097
- Beneficiary	4	21,843
Duty- Disability - Option A	1	7,866
Non-Duty Death benefit	3	44,206
Duty Death benefit	2	36,037
Total Casualty benefits	11	122,049
Total Benefits Being Paid	**265**	**$7,765,570**

RETIREES AND BENEFICIARIES INCLUDED IN DEFINED BENEFIT VALUATION
BY ATTAINED AGES
DECEMBER 31, 2010

Attained Ages	No.	Annual Pensions
40-44	1	$ 7,866
45-49	0	0
50-54	20	884,535
55-59	51	2,317,937
60-64	62	2,064,280
65-69	43	1,030,275
70-74	25	634,327
75-79	26	447,851
80-84	23	257,540
85-89	12	93,513
90-94	1	13,622
95-99	1	13,824
Totals	**265**	**$ 7,765,570**

VESTED TERMINATED MEMBERS INCLUDED IN DEFINED BENEFIT VALUATION
BY ATTAINED AGES
DECEMBER 31, 2010

Attained Ages	Estimated No.	Estimated Annual Benefits
47	1	$ 5,110
49	1	13,230
51	2	15,012
52	1	8,033
53	1	16,662
55	1	13,419
56	1	3,414
57	1	11,442
58	2	31,580
Totals	**11**	**$ 117,902**

ACTIVE MEMBERS - DECEMBER 31, 2010
TABULATED BY VALUATION DIVISIONS

DEFINED BENEFIT MEMBERS

Valuation Division	No.	Annual Payroll	Average Age	Average Service	Average Pay
General	51	$ 3,206,665	52.9 years	21.0 years	$62,876
Public Safety	64	5,752,675	46.0 years	18.8 years	89,886
Totals	115	$ 8,959,340			

ACTIVE MEMBERS INCLUDED IN DEFINED BENEFIT VALUATION

Valn. Date Dec. 31	Active Members					Average				
	General		Public Safety							
	Class/ Exempt	Other	Comm/ Other	TPOA	Total	Valuation Payroll	Age	Service	Pay	% Incr.
1972		183		66	249	$ 2,907,267	36.1 yrs.	4.7 yrs.	$11,676	7.6 %
1973		205		64	269	3,434,997	36.2	4.9	12,770	9.4
1974		222		68	290	4,123,892	36.3	5.3	14,220	11.4
1975		247		81	328	4,996,368	36.2	5.5	15,233	7.1
1976		254	20	62	336	5,615,394	36.8	6.2	16,712	9.7
1977		269	18	63	350	5,970,264	37.7	6.5	17,058	2.1
1978		261	18	69	348	6,628,692	38.0	7.2	19,048	11.7
1979		282	22	72	376	7,700,464	37.9	7.2	20,480	7.5
1980		279	21	86	386	8,947,885	38.0	7.6	23,181	13.2
1981	100	167	25	87	379	9,697,649	38.4	8.3	25,587	10.4
1982	92	163	32	78	365	9,954,722	39.0	9.2	27,273	6.6
1983	94	140	30	78	342	10,214,049	39.2	10.0	29,866	9.5
1984	97	135	32	74	338	10,518,429	39.2	11.3	31,120	4.2
1985	103	139	32	79	353	11,373,793	39.2	11.1	32,220	3.5
1986	108	141	37	79	365	12,048,592	39.5	11.0	33,010	2.5
1987	116	143	41	84	384	13,083,451	40.0	11.3	34,071	3.2
1988	118	142	43	86	389	14,162,413	40.4	11.7	36,407	6.8
1989	122	144	47	86	399	14,774,001	40.5	11.7	37,028	1.7
1990	128	148	46	90	412	16,105,129	41.1	12.0	39,090	5.6
1991	129	150	44	98	421	17,323,677	41.5	12.0	41,149	5.3
1992	132	150	45	96	423	17,619,701	42.0	12.7	41,654	1.2
1993	134	150	47	93	424	18,518,880	42.6	13.1	43,677	4.9
1994	128	147	39	87	401	17,598,618	43.0	13.4	43,887	0.5
1995	127	153	43	95	418	19,039,969	43.4	13.6	45,550	3.8
1996@	**135 ***	**160**	**44**	**95**	**434**	**20,535,959**	**43.2**	**13.1**	**47,318**	**3.9**
1997	55 *	146	37	102	340	16,133,023	42.4	12.1	47,590	0.6
1998	59	116 *	40	99	314	16,201,219	43.0	13.3	51,761	8.8
1999	55	85 #	40	99	279	15,056,554	43.4	14.4	54,553	5.4
2000	55	76	29	97 *	257	15,441,200	44.1	14.8	60,317	10.6
2001	56	73	20	92	241	14,566,460	44.7	14.7	60,442	0.2
2002	59	66	21	71	217	13,552,549	45.7	15.8	62,454	3.3
2003	56	61	19	69	205	13,052,713	46.5	16.3	63,672	1.9
2004	52	54	19	61	186	12,572,374	46.9	16.9	67,593	6.2
2005	48	51	21	54	174	12,099,631	47.7	17.4	69,538	2.9
2006	44	46	20	51	161	11,471,511	48.0	17.6	71,252	2.5
2007	37	40	21	49	147	11,045,745	48.1	18.1	75,141	5.5
2008	37	36	22	47	142	10,953,297	48.8	19.0	77,136	2.7
2009	30	32	20	46	128	10,483,020	48.9	19.1	81,899	6.2
2010	**23**	**28**	**18**	**46**	**115**	**8,959,340**	**49.1**	**19.7**	**77,907**	**(4.9)**

* *Includes 1 member on leave of absence.*
\# *Includes 3 members on leave of absence.*
@ *Represents the peak of active membership.*

ADDITIONS TO AND REMOVALS FROM ACTIVE MEMBERSHIP
ACTUAL AND EXPECTED NUMBERS

Year Ended Dec. 31	Normal Retirement		Disability Retirement		Died-In-Service		Terminations			Active Members End of Year
							Trans. to DC	Other		
	A	E	A	E	A	E	A	A	E	
1991	9	8.7	0	1.1	0	1.0		6	24.8	421
1992	7	6.6	0	1.2	0	1.0		4	23.1	423
1993	6	9.1	0	1.2	0	1.2		11	21.4	424
1994	19	14.6	0	1.2	1	1.1		12	20.5	401
1995	3	8.6	0	1.2	1	1.2		10	17.8	418
1996	15	8.7	0	1.3	0	0.8		9	23.5	434
1997	13	8.7	0	1.3	0	0.8	98	10	23.5	340
1998	4	6.9	0	0.8	0	0.8	28	3	18.6	314
1999	7	8.6	0	0.7	0	0.5	26	7	14.7	279
2000	9	9.3	0	0.6	0	0.4	11	3	10.3	257
2001	4	6.9	0	0.6	1	0.5	10	1	8.2	241
2002	6	5.3	0	0.8	0	0.5	19	0	6.5	217
2003	10	4.4	0	0.7	1	0.4	0	1	5.3	205
2004	15	13.5	0	0.6	0	0.4	0	4	3.5	186
2005	10	13.5	1	0.6	0	0.4	0	1	3.5	174
2006	13	10.6	0	0.6	0	0.4	0	1	3.1	161
2007	13	9.5	0	0.6	0	0.4	0	1	2.6	147
2008	5	11.5	0	0.5	0	0.3	0	0	2.3	142
2009	14	11.7	0	0.5	0	0.3	0	0	2.0	128
2010	**12**	**12.8**	**1**	**0.5**	**0**	**0.3**	**0**	**0**	**1.7**	**115**
5-Yr. Totals	**57**	**56.1**	**1**	**2.7**	**0**	**1.7**	**0**	**2**	**11.7**	

A represents actual number.
E represents expected number based on assumptions outlined in Section C.

GENERAL (CLERICAL) - DECEMBER 31, 2010
BY ATTAINED AGE AND YEARS OF SERVICE

Age	Years of Accrued Service						Totals	
Group	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
30-34		1					1	$ 52,744
35-39							0	0
40-44		1	1				2	116,031
45-49					2		2	112,865
50-54		1	1		1	1	4	198,980
55-59		1		1			2	104,750
60		1					1	45,333
65			1				1	49,668
67		1					1	43,909
Totals		**6**	**3**	**1**	**3**	**1**	**14**	**$ 724,280**

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

Age:	52.1	years.
Service:	18.8	years.
Annual Pay:	$51,734	

GENERAL (CLASSIFIED AND EXEMPT) - DECEMBER 31, 2010
BY ATTAINED AGE AND YEARS OF SERVICE

Age	Years of Accrued Service						Totals	
Group	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
40-44		1	1				2	$ 135,416
45-49				2			2	136,697
50-54		1		3	2	1	7	600,998
55-59		1	2	2	2	3	10	667,701
61					1		1	95,339
68				1			1	51,031
Totals		**3**	**3**	**8**	**5**	**4**	**23**	**$ 1,687,182**

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

Age: 53.9 years.

Service: 23.5 years.

Annual Pay: $73,356

GENERAL (AFSCME) - DECEMBER 31, 2010
BY ATTAINED AGE AND YEARS OF SERVICE

Age	Years of Accrued Service						Totals	
Group	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
40-44		1	1				2	$ 99,540
45-49				1			1	70,189
50-54		1	2	4			7	397,190
55-59			1	1	1		3	174,877
60		1					1	53,407
Totals		**3**	**4**	**6**	**1**		**14**	**$ 795,203**

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

Age: 52.0 years.

Service: 19.1 years.

Annual Pay: $56,800

PUBLIC SAFETY – (T.F.S.O.A.) - DECEMBER 31, 2010
BY ATTAINED AGE AND YEARS OF SERVICE

Age	Years of Accrued Service						Totals	
Group	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
60						1	1	$ 109,373
Totals						**1**	**1**	**$ 109,373**

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

Age: 60.0 years.

Service: 30.5 years.

Annual Pay: $109,373

PUBLIC SAFETY (T.P.O.A.) - DECEMBER 31, 2010
By Attained Age and Years of Service

Age	Years of Accrued Service						Totals	
Group	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
30-34		2					2	$ 151,114
35-39	1	5					6	511,325
40-44		6	7	2			15	1,216,273
45-49			3	6			9	736,549
50-54			3	3	1		7	584,912
55-59			2	2		1	5	434,389
60		1			1		2	152,626
Totals	**1**	**14**	**15**	**13**	**2**	**1**	**46**	**$ 3,787,188**

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

Age: 45.6 years.

Service: 17.8 years.

Annual Pay: $82,330

PUBLIC SAFETY (T.C.O.A.) - DECEMBER 31, 2010
BY ATTAINED AGE AND YEARS OF SERVICE

Age	Years of Accrued Service						Totals	
Group	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
35-39		1					1	$ 89,025
40-44		3	3				6	622,617
45-49				2	1		3	325,379
50-54				3	3		6	699,248
55-59						1	1	119,845
Totals		**4**	**3**	**5**	**4**	**1**	**17**	**$ 1,856,114**

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

Age: 46.4 years.

Service: 20.7 years.

Annual Pay: $109,183

SECTION C

FINANCIAL PRINCIPLES, ACTUARIAL VALUATION PROCESS, ACTUARIAL COST METHODS, ACTUARIAL ASSUMPTIONS AND DEFINITIONS OF TECHNICAL TERMS

BASIC FINANCIAL PRINCIPLES AND OPERATION OF THE RETIREMENT SYSTEM

Benefit Promises Made Which Must Be Paid For. A retirement program is an orderly means of handing out, keeping track of, and financing pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit the member is, in effect, handed an "IOU" which reads: "The City of Troy Employees Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire."

The principal related financial question is: When shall the money required to cover the "IOU" be contributed? This year, when the benefit of the member's service is received? Or, some future year when the "IOU" becomes a cash demand?

The Constitution of the State of Michigan is directed to the question:

> "Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities."

This Retirement System meets this requirement by having as its ***financial objective the establishment and receipt of contributions which will fund the expected benefits over the average future working lifetimes of the remaining active members***.

The accumulation of invested assets ***is a by-product of prefunding a retirement system, not the objective.*** Investment income is a major contributor to the retirement program, and the amount is directly related to the amount of contributions and investment performance.

If contributions to the retirement program are less than the preceding amount, the difference, ***plus investment earnings not realized thereon,*** will have to be contributed at some later time (or benefits will have to be reduced) to satisfy the fundamental fiscal equation under which all retirement programs must operate:

$$\mathbf{B = C + I - E}$$

The aggregate amount of **B**enefit payments to any group of members and their beneficiaries cannot exceed the sum of:

The aggregate amount of **C**ontributions received on behalf of the group

... plus ...

Investment earnings on contributions received and not required for immediate cash payments of benefits

... minus ...

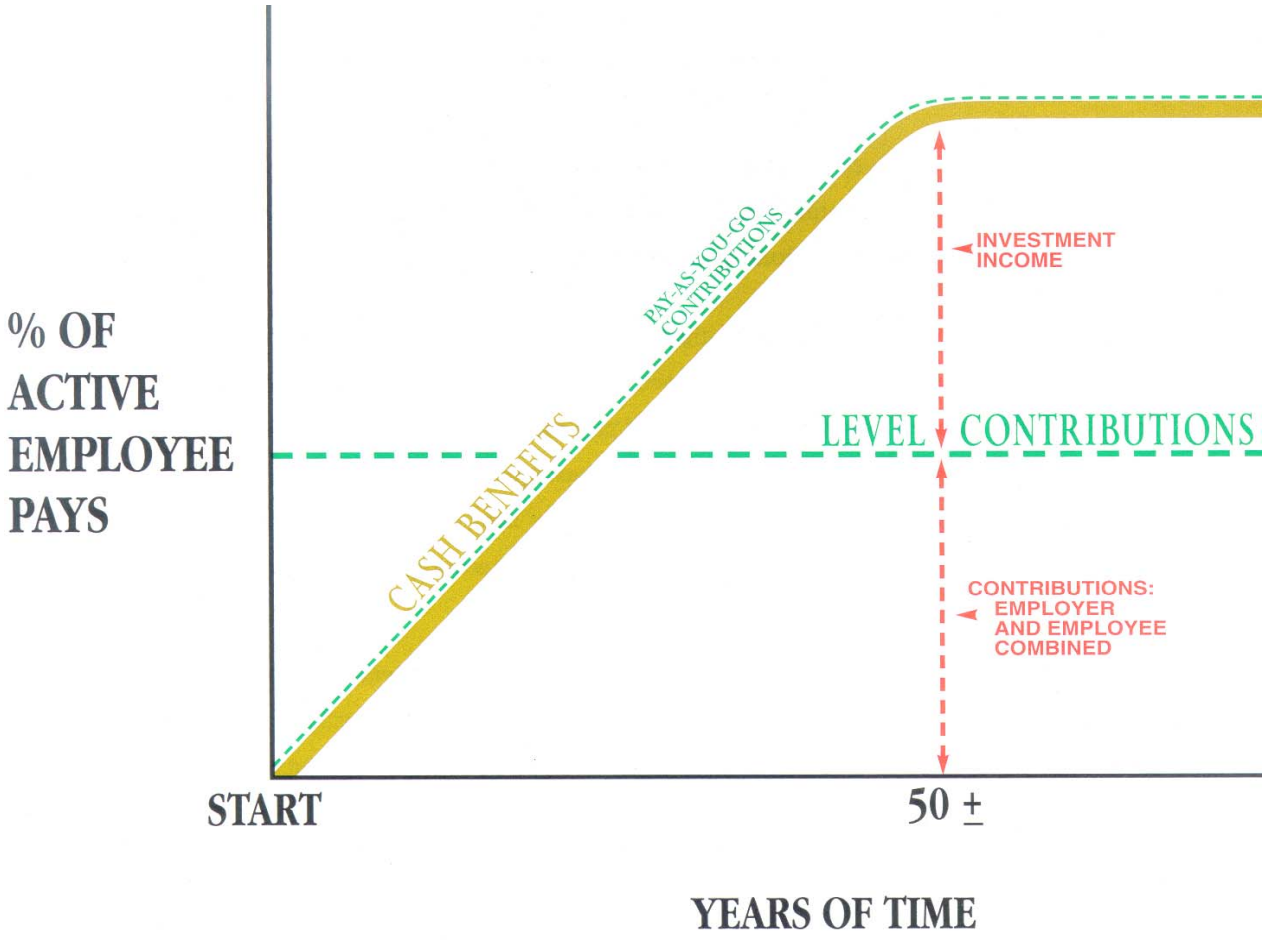
The **E**xpenses of operating the program.

There are retirement programs designed to defer the bulk of contributions far into the future. The present contribution rate for such systems is ***artificially low***. The fact that the contribution rate is destined to increase relentlessly to a much higher level is often ignored.

This method of financing is prohibited in Michigan by the state constitution.

Computed Contribution Rate Needed to Finance Benefits. From a given schedule of benefits and from the data furnished, the actuary calculates the contribution rate ***by means of an actuarial valuation*** - the technique of assigning monetary values to the risks assumed in operating a retirement program.

Prefunding retirement benefits results in each generation of taxpayers paying for the benefits earned during that generation. Deferring the bulk of contributions into the future can result in the next generation paying for the benefits earned in the current generation.



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

Economic Risk Areas

- Rates of investment return
- Rates of pay increase
- Changes in active member group size

Non-Economic Risk Areas

- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

THE ACTUARIAL VALUATION PROCESS

The ***financing diagram*** on the previous page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) which is an ***increasing contribution method;*** and the ***level contribution method*** which equalizes contributions between the generations.

The ***actuarial valuation*** is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. ***Covered Person Data***, furnished by plan administrator.

Retired lives now receiving benefits

Former employees with vested benefits not yet payable

Active employees

B. + ***Asset data*** (cash & investments), furnished by plan administrator

C. + ***Assumptions concerning future financial experience in various risk areas***, which assumptions are established by the Board of Trustees after consulting with the actuary

D. + The ***funding method*** for employer contributions (the long-term, planned pattern for employer contributions)

E. + ***Mathematically combining the assumptions, the funding method, and the data***

F. = Determination of:

Plan financial position

and/or New Employer Contribution Rate

ACTUARIAL COST METHODS USED FOR THE VALUATION

The funding method used in this actuarial valuation is the ***Aggregate Cost Method.*** Under this method the Actuarial Present Value of Projected Benefits of the group included in the valuation, less the sum of the Funding Value of Assets and the Actuarial Present Value of Future Member Contributions is allocated over a future scheduled period. This allocation is performed for the group as a whole, not as a sum of individual allocations. The portion of this Actuarial Present Value allocated to a specific year is called the **City's Annual Normal Cost**. Under this method, actuarial gains (losses) reduce (increase) future Normal Costs.

ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS

The actuary calculates contribution requirements and actuarial present values of a retirement system by applying actuarial assumptions to the benefit provisions and people information of the system, using the actuarial cost methods described on page C-5.

The principal areas of risk which require assumptions about future experience are:

(i) Long-term rates of investment return to be generated by the assets of the System.
(ii) Patterns of pay increases to members.
(iii) Rates of mortality among members, retirants and beneficiaries.
(iv) Rates of withdrawal of active members.
(v) Rates of disability among active members.
(vi) The age patterns of actual retirements.

In making a valuation, the actuary calculates the monetary effect of each assumption for as long as a present covered person survives - - - a period of time which can be as long as a century.

The employer contribution rate has been computed to remain level from year to year so long as benefits and the basic experience and make-up of members do not change. Examples of favorable experience which would tend to reduce the employer contribution rate are:

(1) Investment returns in excess of 6.5% per year.
(2) Member non-vested terminations at a higher rate than outlined on page C-11.
(3) Mortality among retirees and beneficiaries at a higher rate than indicated by the RP-2000 Combined Healthy Mortality Table.

Examples of unfavorable experience which would tend to increase the employer contribution rate are:

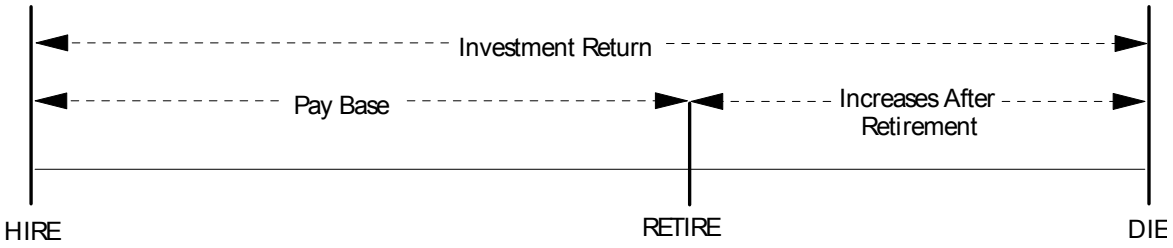
(1) Pay increases in excess of the rates outlined on page C-9.

(2) An acceleration in the rate of retirement from the rates outlined on page C-12.

Actual experience of the system will not coincide exactly with assumed experience, regardless of the choice of the assumptions, the skill of the actuary or the precision of the calculations. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time one or more of the assumptions is modified to reflect experience trends (but not random or temporary year to year fluctuations).

RELATIONSHIP OF ECONOMIC ASSUMPTIONS IN COMPUTING CONTRIBUTIONS TO A RETIREMENT SYSTEM



Investment Return

An increase in this assumption reduces computed contributions. The assumption operates over all parts of an employee's lifetime.

Pay Base

An increase in this assumption increases computed contributions. However, a 1% increase in this assumption, coupled with a 1% increase in Investment Return reduces computed contributions. This is because the Pay Base assumption operates only over an employee's working lifetime, while the Investment Return assumption operates over the employee's entire lifetime, and therefore has a greater effect.

Increases After Retirement

An increase in this element increases computed contributions.

If Investment Return, Pay Base, and Increases After Retirement are each increased by equal amounts, computed contributions remain the same (except in plans using Final Average Pay as a factor in computing benefits; the multi-year average used for Final Average Pay causes computed contributions to decrease slightly).

If Investment Return and Pay Base are increased by equal amounts, with no change in Increases After Retirement, computed contributions decrease – sometimes significantly. The decreases represent the projected devaluation of an employee's benefits following retirement.

ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION

Investment Return (net of expenses).

6.5% per year, compounded annually. This rate consists of a real rate of return of 3.0% per year plus a long-term rate of wage inflation of 3.5% per year.

This assumption is used to equate the value of payments due at different points in time and was first used for the December 31, 1995 valuation. The 3.5% wage inflation assumption was first used for the December 31, 2007 valuation. Approximate rates of investment return, for the purpose of comparisons with assumed rates, are shown below:

	Year Ended December 31				
	2010	**2009**	**2008**	**2007**	**2006**
Recognized Rate of Investment Return of Funding Value of Assets	4.9%	2.9%	0.7%	7.2%	6.7%

The nominal rate of return was computed using the approximate formula i = I divided by 1/2 (A + B - I), where I is actual investment income (after smoothing gains and losses) net of expenses, A is the beginning of year valuation asset value, and B is the end of year valuation asset value.

These rates of return should not be used for measurement of an investment advisor's performance or for comparisons with other systems -- to do so will mislead.

Pay Projections. These assumptions are used to project current pays to those upon which benefits will be based. The assumptions were first used for the December 31, 2007 valuation.

Annual Rate of Pay Increase for Sample Ages

Sample Ages	Base (Economic)	Merit and Longevity	Total
35	3.5	2.5	6.0
40	3.5	2.2	5.7
45	3.5	1.7	5.2
50	3.5	1.2	4.7
55	3.5	0.7	4.2
60	3.5	0.2	3.7

Changes actually experienced in average pay have been as follows:

Increase in	Year Ended December 31 2010	2009	2008	2007	2006	3-Year Average	5-Year Average
Average pay	(4.9)%	6.2%	2.7%	5.5%	2.5%	1.2%	2.3%

Note: The changes in average pay shown above are affected by changes in active membership during the year as well as individual annual pay increases of the members.

Mortality Table. The RP-2000 Combined Healthy Mortality Table, for males and females. This table was first used for the December 31, 2007 valuation. Sample values follow:

Sample Attained Ages	Single Life Retirement Values: Present Value of $1.00 Monthly for Life		Single Life Retirement Values: Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	$156.42	$161.11	30.80	33.59
55	146.11	152.04	26.18	28.91
60	133.49	140.76	21.74	24.38
65	118.85	127.55	17.61	20.12
70	102.73	112.76	13.88	16.23
75	85.47	96.73	10.57	12.74
80	68.04	79.91	7.75	9.68

This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement.

Rates of separation from active membership. The rates do not apply to members eligible to retire and do not include separation on account of death or disability. This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	Percent Separating Within Next Year	
		General	Public Safety
ALL	0	30.00 %	15.00 %
	1	20.00	10.00
	2	15.00	8.00
	3	10.00	7.00
	4	7.00	6.00
25	5 & Over	6.00	5.00
30		6.00	4.50
35		6.00	3.55
40		6.00	1.45
45		3.50	0.75
50		1.50	0.75
55		1.50	0.75
60		1.50	0.75

The rates were first used for the December 31, 1975 valuation.

Rates of Disability. These assumptions represent the probabilities of active members becoming disabled.

Sample Ages	Percent Becoming Disabled Within Next Year	
	Men	Women
20	0.08 %	0.10 %
25	0.08	0.10
30	0.08	0.10
35	0.08	0.10
40	0.20	0.36
45	0.26	0.41
50	0.49	0.57
55	0.89	0.77
60	1.41	1.02
65	1.66	1.23

These rates were first used for the December 31, 1976 valuation.

Rates of Retirement. These rates are used to measure the probabilities of an eligible member retiring during the next year.

Retirement Ages	Percent of Active Members Retiring Within Next Year			
		Public Safety		
	General	T.F.S.O.A. & Exempt	T.C.O.A.	T.P.O.A.
43			35	40
44			25	40
45			20	40
46			15	40
47			15	40
48			15	40
49			15	35
50	15	35	15	20
51	10	25	25	15
52	5	20	30	15
53	5	15	100	15
54	5	15		15
55	5	15		15
56	5	15		15
57	5	15		25
58	5	25		100
59	5	30		100
60	5	100		
61	5			
62	30			
63	10			
64	10			
65	100			

T.P.O.A, T.F.S.O.A. and T.C.O.A. members were assumed to be eligible for retirement after 25 years of service, or after attaining age 60 with 10 or more years of service. General AFSCME, General Clerical, and Classified or Exempt members were assumed to be eligible for retirement after attaining age 50 with 27 years of service, or age 55 with 25 years of service; or age 60 with 10 years of service.

These rates were first used for the December 31, 1973 valuation. The rates for Classified, Exempt and Command Officers were first used for the December 31, 1981 valuation. The rates for Non-Classified/Exempt General members were first used for the December 31, 1986 valuation.

SUMMARY OF ASSUMPTIONS USED
DECEMBER 31, 2010

Pensions in an Inflationary Environment

VALUE OF $1,000/MONTH RETIREMENT BENEFIT
To an Individual Who Retires at Age 60
In an Environment of 3.50% Inflation

Age	Value
60	$1,000
61	966
62	933
63	901
64	871
65	842
70	708
75	596
80	502
85	423

The life expectancy of a 60 year old male retiree is age 82. The life expectancy for a 60 year old female retiree is age 84. 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, 2010

Marriage Assumption. 90% of males and 90% 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.

Incidence of Contributions. Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.

DEFINITIONS OF TECHNICAL TERMS

Accrued Service. Service credited under the system which was rendered before the date of the actuarial valuation.

Actuarial Accrued Liability. The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as "past service liability".

Actuarial Assumptions. Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future benefits" between future normal costs and actuarial accrued liability. Sometimes referred to as the "actuarial funding method".

Actuarial Equivalent. One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.

Actuarial Gain (Loss). The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities -- during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.

Actuarial Present Value. The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payments.

Amortization. Paying off an interest-discounted amount with periodic payments of interest and (generally) principal -- as opposed to paying off with a lump sum payment.

Aggregate Cost Method is a method where the Actuarial Present Value of Projected Benefits of the group included in the valuation, less the sum of the Funding Value of Assets and the Actuarial Present Value of Future Member Contributions is allocated over a future scheduled period. This allocation is performed for the group as a whole, not as a sum of individual allocations. The portion of this Actuarial Present Value allocated to a specific year is called the **City's Annual Normal Cost**. Under this method, actuarial gains (losses) reduce (increase) future Normal Costs.

Credited Projected Benefit. The portion of a member's projected benefit attributable to service before the valuation date - allocated based on the ratio of accrued service to projected total service and based on anticipated future compensation.

Experience Gain (loss). The difference between actual actuarial costs and assumed actuarial costs – during the period between two valuation dates.

Funding Value of Assets. Also referred to as actuarial value of assets, smoothed market value of assets, or valuation assets.

Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased in over a closed 5 year period. During periods when investment performance exceeds the assumed rate, valuation assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, valuation assets will tend to be greater than market value. If assumed rates are exactly realized for 4 consecutive years, valuation assets will become equal to market value.

Normal Cost. The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as "current service cost".

Unfunded Actuarial Accrued Liabilities. The difference between actuarial accrued liabilities and valuation assets. Sometimes referred to as "unfunded past service liability" or "unfunded supplemental present value".

Most retirement systems have unfunded actuarial accrued liabilities. They arise each time new benefits are added and each time an actuarial loss occurs.

The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).

SECTION D

CERTAIN DISCLOSURES REQUIRED BY STATEMENTS NO. 25 AND NO. 27 OF THE GOVERNMENTAL ACCOUNTING STANDARDS BOARD

This information is presented in draft form for review by the City's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the City's financial statements.

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. The excess of the Actuarial Present Value of Projected Benefits of the group included in an Actuarial Valuation over the Actuarial Value of Assets is allocated **on a level basis over the payroll of the group between the valuation date and assumed exit.** This allocation is performed for the group as a whole, not as a sum of individual allocations. That portion of the Actuarial Present Value allocated to a valuation year is called the Normal Cost. The Actuarial Accrued Liability is equal to the Actuarial Value of Assets. Under this method, the Actuarial Gains (Losses), as they occur, reduce (increase) future Normal Costs.

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

The Present Value of Projected Benefits was determined as part of an actuarial valuation of the plan as of December 31, 2010. Significant actuarial assumptions used in determining the Present Value of Projected Benefits include (a) a rate of return on the investment of present and future assets of 6.5% per year compounded annually, (b) projected salary increases of 3.5% per year compounded annually, (c) additional projected salary increases of 0.0% to 2.5% per year attributable to seniority/merit, and (d) that there will be no cost of living adjustments after retirement.

Actuarial Present Value of All Past and Future Benefits	
Active members	$ 61,231,662
Retired members and beneficiaries currently receiving benefits	88,664,507
Vested terminated members not yet receiving benefits	951,004
Total	150,847,173
Actuarial Value of Assets (market value was $134,391,230)	133,400,223
Present Value of Future Employee Contributions	1,920,579
Unfunded Present Value of Future Benefits	$ 15,526,371

During the year ended December 31, 2010, the Plan experienced a net change of ($2,398,978) in the actuarial present value of projected benefits. There were no changes in actuarial assumptions or benefits 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)	Active Member Covered Payroll (c)	Unfunded AAL as a Percentage of Active Member Covered Payroll ((b-a)/c)
1995	$ 94,730	$ 85,625	$ (9,105)	110.6	$19,040	(47.8) %
1996	106,334	92,845	(13,489)	114.5	20,536	(65.7)
1997	120,718	105,689	(15,029)	114.2	16,133	(93.2)
1998	109,474	90,869	(18,605)	120.5	16,201	(114.8)
1999	118,595	94,661	(23,934)	125.3	15,057	(159.0)
2000	123,956	99,740	(24,216)	124.3	15,441	(156.8)
2001	123,669	97,140	(26,529)	127.3	14,566	(182.1)
2002	117,372	95,527	(21,845)	122.9	13,553	(161.2)
2003	126,738	103,558	(23,180)	122.4	13,053	(177.6)
2004	126,802	109,364	(17,438)	115.9	12,572	(138.7)
2005	128,790	113,260	(15,530)	113.7	12,100	(128.4)
2006	132,168	119,299	(12,869)	110.8	11,472	(112.2)
2007	132,917	123,162	(9,755)	107.9	11,046	(88.3)
2008	128,249	126,138	(2,111)	101.7	10,953	(19.3)
2009	132,465	139,519	7,054	94.9	10,483	67.3
2010	**133,400**	**139,232**	**5,832**	**95.8**	**8,959**	**65.1**

 # Smoothed-market value.

** Reflects entry age normal actuarial cost method to comply with GASB Statement No. 50.*

REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULE OF EMPLOYER CONTRIBUTIONS

Fiscal Year Ending June 30	Actuarial Valuation Date December 31	Annual Required Contribution* (In thousands)
1995	1993	$3,146
1996	1994	3,267
1997	1995	3,367
1998	1996	2,759
1999	1997	2,655
2000	1998	1,087
2001	1999	1,174
2002	2000	1,461
2003	2001	1,605
2004	2002	1,482
2005	2003	117
2006	2004	213
2007	2005	273
2008	2006	273
2009	2007	428
2010	2008	1,361
2011	**2009**	**2,505**

* *Since it was stated to the actuary that the City's practice is to contribute the percent of payroll employer contribution rate shown in the actuarial valuation results, the values shown are the actual contributions reported by the City in the fiscal year. Also, for fiscal years ending in 2004 and earlier, annual required contributions include contributions for retiree health benefits.*

NOTES TO REQUIRED SUPPLEMENTARY INFORMATION
SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date	12/31/2010
Actuarial Cost Method	Aggregate
Asset Valuation Method	5-year smoothed market
Actuarial Assumptions:	
Investment Rate of Return*	6.5%
Projected Salary Increases*	3.5% - 7.5%
*Includes Inflation	3.5%

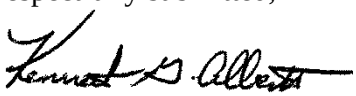
October 25, 2011

Ms. Monica Irelan
Assistant City Manager
City of Troy
500 West Big Beaver Road
Troy, Michigan 48084

Dear Monica:

Enclosed are twenty copies of the report of the Forty-Seventh Annual Actuarial Valuation of the City of Troy Employees Retirement System.

Respectfully submitted,



Kenneth G. Alberts

KGA:sc
Enclosures

cc: Rehman Robson
Randall Dziubek
Brad Armstrong

Rehmann Robson
5750 New King – Suite 100
Troy, MI 48098