



CITY OF RICHMOND HEIGHTS  
POLICE AND FIREMEN  
RETIREMENT FUND

ACTUARIAL VALUATION  
FOR THE PLAN YEAR  
BEGINNING JULY 1, 2005

GRS

Gabriel Roeder Smith & Company



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## SECTION 1 INTRODUCTION AND COMMENTS

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A. Introduction

An actuarial valuation of the City of Richmond Heights Policemen and Firemen's Retirement Fund was performed as of July 1, 2005 for the Plan year ending June 30, 2006. The valuation was made to determine (i) the position of the Trust Fund, (ii) the minimum required contribution and (iii) certain information which may be required by the City's auditors.

Section 2 gives a summary of valuation results. A discussion of the results is given in the Comments portion of this Section.

The valuation was based on the following:

- (a) Actuarial assumptions with respect to the rate of investment return, the rate of salary increases, the rate of cost-of-living increases, and probabilities of death, withdrawal, retirement and disability. These actuarial assumptions, along with an explanation of the actuarial cost method, are set forth in Section 3.
- (b) The principal provisions of the Plan as in effect on July 1, 2005. These provisions of the Plan are summarized in Section 4.
- (c) Financial information on the Trust Fund supplied by the City Commerce Trust Company, Vanguard, Black Rock Funds, Quaker Securities and Silchester International.
- (d) Employee data furnished by the City as of July 1, 2005. This employee data, along with data on Retired Participants and Beneficiaries receiving benefits is summarized in Section 2.

The Funded Ratio, which is a measurement of the funding status of the Plan, is shown in Section 6.

The results of the valuation and the development of the costs for the year are shown in Section 7.

B. Comments

The Plan had favorable investment experience over the last two years and continues to have an Unfunded Actuarial Accrued Liability of \$0 on July 1, 2005. The actuarially required contribution for the year ending June 30, 2006 is equal to the normal cost of \$704,403, which is less than the expected actual contribution of \$1,015,139.

A measure of the Plan's current funded ratio is presented in Section 6. As of July 1, 2005, the funded ratio was 103% as compared to 108% on July 1, 2003.

It is the actuary's opinion that the required contribution rates determined by this actuarial valuation are sufficient to meet the plan's benefit obligations, presuming continued receipt of required contributions when due.

Respectfully submitted,



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ASA, EA, FCA, MAAA



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ASA, EA, MAAA

BLA:RJD:jm

**SECTION 2**  
**SUMMARY OF VALUATION RESULTS**

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	<u>July 1, 2003</u>	<u>July 1, 2005</u>
<b>A. Summary of Data</b>		
(1) Participants		
(a) Active		
Non-Vested	40	38
Vested	<u>23</u>	<u>26</u>
Total	63	64
(b) Retirees	12	15
(c) Disabled	7	8
(d) Beneficiaries	6	5
(e) Vested terminated	2	2
(f) Total Inactive	27	30
(g) Total participants	90	94
(2) Average monthly benefit		
(a) Retirees	\$ 1,624	\$ 1,649
(b) Disabled	1,824	1,939
(c) Beneficiaries	1,096	1,070
(d) Vested terminated	1,885	1,882
(3) Covered compensation	3,336,718	3,646,061
(a) Average compensation	52,964	56,970
 <b>B. Summary of Assets</b>		
(1) Market Value	\$ 17,608,066	\$ 22,259,308
(2) Actuarial Value	19,282,800	22,554,784
 <b>C. Contribution Requirements</b>		
(1) Unfunded Actuarial Accrued Liability	\$ 0	\$ 0
(2) Normal Cost	657,903	704,403
(3) Actuarially Required Contribution	657,903	704,403
(4) Expected tax revenue at 32.0¢ per \$100 assessed valuation	865,840	1,015,139

**SECTION 2**  
**DATA RECONCILIATION**

	<u>ACTIVE PARTICIPANTS</u>	<u>DEFERRED PARTICIPANTS</u>	<u>RETIREEES</u>	<u>BENEFICIARIES</u>	<u>DISABLEDS</u>	<u>TOTAL</u>
July 1, 2003	63	2	12	6	7	90
Valuation Adjustment	1		1			2
Adjusted July 1, 2003 Data	64	2	13	6	7	92
New Disabled Participant	(1)				1	0
New Retired Participant	(1)	(1)	2			0
New Deferred Participant	(1)	1				0
Terminated Non- Vested	(7)					(7)
Deaths				(1)		(1)
New Entrant	10					10
July 1, 2005	64	2	15	5	8	94

**ACTIVE PARTICIPANTS JULY 1, 2005**  
**BY NEAR AGE AND YEARS OF SERVICE**

Near Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24									
25-29	6							6	\$283,760
30-34	4	5						9	448,425
35-39	3	5	4	1				13	698,238
40-44		4	3	1	1			9	499,652
45-49	1		1	3	1	3		9	543,381
50-54				1	2	4	3	10	635,787
55-59	1		1	1		1	1	5	301,711
60+							3	3	235,107
<b>Totals</b>	<b>15</b>	<b>14</b>	<b>9</b>	<b>7</b>	<b>4</b>	<b>8</b>	<b>7</b>	<b>64</b>	<b>\$ 3,646,061</b>

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

Age: 42.56 years  
Service: 14.43 years  
Annual Pay: \$56,970

### SECTION 3

#### ACTUARIAL COST METHOD AND ASSUMPTIONS

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A. Actuarial Cost Method

The actuarial cost method used to determine the annual cost of the Plan is a projected benefit, level cost with supplemental liability cost method which is usually referred to as the Entry Age Actuarial Cost Method. Under this method, there is an allocation of costs between past and future service at the time of each actuarial valuation of the Plan.

The portion of the Plan's cost allocated to past service is known as the Actuarial Accrued Liability. Supplements to the Actuarial Accrued Liability may be established as a result of actuarial gains or losses, Plan amendments and changes in the actuarial assumptions or actuarial cost method. The Unfunded Actuarial Accrued Liability represents the progress that has been made in amortizing the Actuarial Accrued Liability. The contribution each year, in excess of the amount needed to pay the annual Normal Cost, is first used to pay interest accruing on the Unfunded Actuarial Accrued Liability and then to reduce the Unfunded Actuarial Accrued Liability. If actual experience varies from the actuarial assumptions, actuarial gains (or losses) will arise. Actuarial gains (or losses) result in a decrease (or increase) in the Unfunded Actuarial Accrued Liability.

The portion of the Plan's cost allocated to future service is reflected in the annual Normal Cost for the current and future years. The annual Normal Cost each year is determined as follows:

- (a) The Actuarial Present Value of Future Benefits is determined as the amount currently needed to fund all benefits that may become payable under the Plan. The actuarial assumptions relating to mortality, turnover, disability and retirement are used to calculate the benefits expected to be paid and then the assumed interest rate is used to discount these expected future benefit payments back to the present time.
- (b) The Actuarial Present Value of Future Benefits is determined at an employee's entry age. Entry age is the date the employee would have commenced plan participation had the Plan always been in existence. The Actuarial Present Value of Future Benefits at entry age is then divided by the Actuarial Present Value of the employee's future compensation to determine the Normal Cost for the individual employee. The sum of all the individual Normal Costs is the annual Normal Cost for the Plan Year.
- (c) The Present Value of Future Normal Costs is determined by multiplying the average annual Normal Cost rate by the Actuarial Present Value of the Future Compensation of all employees in the Plan. The Actuarial Accrued Liability is obtained by subtracting the Actuarial Present Value of Future Normal Costs from the Actuarial Value of Future Benefits. This difference is equal to the annual Normal Costs that have accrued for each employee in the Plan.

- (d) The Unfunded Actuarial Accrued Liability is obtained by subtracting the Actuarial Value of Assets from the Actuarial Accrued Liability. The Actuarial Value of Assets is the cost of the assets.

Section 7 shows the determination of the annual Normal Cost and Unfunded Actuarial Accrued Liability for the current Plan Year.

B. Actuarial Assumptions

The following actuarial assumptions were used in the valuation:

Interest -	8% per annum.
Salary Increase -	Compensation is assumed to increase at the rate of 5% per year. 3-1/2% for inflation and 1.5% for promotion and merit.
Mortality -	The 1983 Group Annuity Mortality Table.
Disability Mortality -	The 1983 Group Annuity Mortality Table set forward five years.
Duty-Related Mortality -	0.05% at each age, included in above rates.
Withdrawals -	Graduated rates, as illustrated below.
Disabilities -	Graduated rates, as illustrated below. One-third of the disabilities are assumed to be non-duty related.
Retirement -	A rate of 75% upon reaching 30 years of service or age 60 with 15 years of service; rates of 10% per year for each year after 30 years to age 61; a rate of 25% at age 62, 10% at age 63, 15% at age 64, and a rate of 100% for age 65 and over.

Expenses - Interest rate assumed to be net of expenses.

Marital Status - Participants are assumed to have an 80% probability of being married for death in service benefits and 100% at retirement. Males are assumed to be three years older than their spouses.

Cost-of-Living - Participants and beneficiaries in pay status prior to July 1, 1987 are assumed to receive 4% cost-of-living increases per year. After July 1, 1987, 5% to age 65.

<u>Age</u>	<u>Male Mortality</u>		<u>Female Mortality</u>		<u>Terminations</u>	<u>Disabilities</u>
	<u>Service</u>	<u>Disability</u>	<u>Service</u>	<u>Disability</u>		
25	0.046%	0.061%	0.025%	0.034%	10.000%	0.150%
30	0.061%	0.086%	0.034%	0.048%	7.800%	0.180%
35	0.086%	0.124%	0.048%	0.066%	4.900%	0.230%
40	0.124%	0.218%	0.066%	0.101%	3.100%	0.300%
45	0.218%	0.391%	0.101%	0.165%	2.300%	0.510%
50	0.391%	0.613%	0.165%	0.254%	2.300%	1.000%
55	0.613%	0.916%	0.254%	0.424%	2.100%	1.550%
60	0.916%	1.559%	0.424%	0.706%	1.500%	0.000%
65	1.559%	2.753%	0.706%	1.238%	1.500%	0.000%

C. Actuarial Asset Valuation Method

Assets are valued using the assumed yield method, with a 25% adjustment to market value. Under the assumed yield asset valuation method, the prior year's actuarial value is increased at the assumed rate of return with appropriate adjustments for contributions and disbursements to produce an expected actuarial value of assets at the end of the year. The expected actuarial value is compared to the market value of assets and 25% of the difference is added to the expected actuarial value to produce the actuarial value at the end of the year. The method is adopted prospectively, beginning with the July 1, 1999 actuarial valuation. The initial actuarial value is the market value of assets as of July 1, 1999.

### SECTION 3

#### MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

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**Marriage Assumption.** 80% of males and 80% 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 directly, without adjustment for multiple decrement table effects.

**Decrement Operation.** Disability and withdrawal do not operate during retirement eligibility.

**Normal Form of Benefit.** The assumed normal form of benefit is 25% joint and survivor.

**Loads.** None.

**Incidence of Contributions.** Contributions are assumed to be received monthly throughout the year based upon the computed contributions shown in this report.

### SECTION 3

#### DEFINITIONS OF TECHNICAL TERMS

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**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.

**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 4**  
**SUMMARY OF THE PRINCIPAL PROVISIONS OF THE PLAN**  
**AS OF JULY 1, 2005**

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- (1) Plan Effective Date  
The effective date of the revised Plan is July 1, 1981.
- (2) Covered Employees  
All employees of the police or fire departments of the City of Richmond Heights (but excluding dispatchers, school traffic officers, and special duty marshals of the City) automatically participate in the Plan as of their employment date.
- (3) Retirement Base Pay  
Average base for the three years prior to the employee's date of termination of employment.
- (4) Normal Retirement Benefit
- Eligibility:           (1) Attained age 60, or  
                              (2) Thirty years of service.
- Form:                    Life annuity, payable monthly for single participants and 25%  
                              Joint and Survivor for married participants.
- Amount:               (1) 60% of Retirement Base Pay  
                              (2) Plus a refund of employee contributions without interest with  
                              the initial monthly payment only.
- (5) Termination Benefit
- Vesting Percentage:   100% after 15 years of service.
- Benefit
- Commencement:       Earlier of:  
                              (1) Attained age 60; or  
                              (2) Date participant would have accrued 30 years of service.
- Form:                   (1) Life annuity payable monthly; or  
                              (2) Joint and 50% survivorship annuity payable monthly, if  
                              participant is married on retirement date (widow's benefits  
                              cease upon earlier of death or remarriage).
- Amount:               Normal Retirement Benefit determined on date of termination,  
                              but reduced proportionately for less than 30 years of service.
- (6) Duty Disability Retirement Benefit:
- Eligibility:           Permanent and total disability resulting from the performance  
                              of duties, and rendering the employee incapable of performing  
                              any of his duties.

- Form: A monthly benefit payable during continuance of disability.
- Amount: (1) 66-2/3% of Retirement Base Pay.  
(2) Plus a refund of employee contributions without interest at age 65.
- (7) Non-Duty Disability Retirement Benefit
- Eligibility: Permanent and total disability not resulting from the performance of duties after two years of service.
- Form: Same as Duty Disability Retirement Benefit.
- Amount: Greater of:  
(1) 25% of Retirement Base Pay; or  
(2) 60% of Retirement Base Pay reduced proportionately for less than 30 years of service  
(3) Plus a refund of employee contributions without interest at age 65.
- (8) Funeral Death Benefit
- Eligibility: Death of any active, deferred vested, or retired participant.
- Form: Lump sum payment.
- Amount: \$1,000.
- (9) Duty Death Benefit
- Eligibility: Death resulting from the performance of duties.
- Form: Monthly annuity. Widow's payments cease upon earlier of death or remarriage. Children's payments cease upon earlier of death, marriage, or attainment of age 20.
- Amount: 50% of Retirement Base Pay for eligible widow, plus an additional 5% of each unmarried child under age 20.
- (10) Non-Duty Death Benefit
- Eligibility: (1) Death of an active participant not resulting from performance of duties; or  
(2) Death of a retired participant.
- Form: Monthly annuity. Widow's payments cease upon earlier of death or remarriage. Children's payments cease upon earlier of death, marriage, or attainment of age 20.
- Amount: 25% of Retirement Base Pay for eligible widow, plus an additional 5% for each unmarried child under age 20, subject to a total maximum of 50% of Base Pay.

(11) Contributions

Employee: 3% of Base Pay. If at any time subsequent to April 7, 2003, the Plan's funded status falls below 90%, contributions will be increased to 4% of Base Pay.

Employer: 32.0¢ per \$100 of assessed valuation.

(12) Refund of Contributions - Termination

Eligibility: A participant who leaves the service of the City for any reason when no other benefit is payable.

Amount: Return of participant's contributions, plus interest credited at 5.0% per year.

(13) Refund of Contributions - Death or Retirement

Eligibility: (a) Participants who retire on account of age and service or disability.

(b) Participants who die while active or while receiving a disability pension.

Amount: (a) A one time lump sum equal to the participants accumulated employee contributions, without interest, is payable after retirement at the earlier of age 60 or the 30<sup>th</sup> anniversary of employment.

(b) A one-time lump sum equal to the participant's accumulated contributions, without interest, is payable upon the death of the participant.

(14) Reduction of Benefits

Plan benefits to retired and disabled participants are reduced by the amount of any workers compensation benefits or Social Security benefits payable to the participant upon initial eligibility. Increases in Social Security benefits subsequent to initial eligibility do not reduce Plan benefits. For participants in active service after July 2, 2000 and who retire subsequent to July 2, 2000, Plan benefits are reduced by 50% of Social Security benefits. For participants in active service after May 8, 2003 and who retire subsequent to May 8, 2003, Plan benefits will not be reduced by Social Security benefits.

(15) Post-Retirement Benefit Increases

Benefits in pay status prior to July 1, 1987 are automatically increased to reflect changes in Base Pay.

Benefits entering pay status after June 30, 1987 are automatically adjusted by the average per participant increase in Base Pay of the entire Police and Fire departments during the previous fiscal year up to the date the participant attains or would have attained age 65.

**SECTION 5**  
**ASSET DEVELOPMENT**

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The value of the assets used in the actuarial valuation of a pension plan is known as the "Actuarial Value of Assets." The Actuarial Value of Assets used in the valuation is calculated using an assumed yield method (described in Section 3). It was adopted in 1999. The determination of the Actuarial Value of Assets is as follows:

(1) Actuarial Value on July 1, 2003	\$ 19,282,800
(2) Adjustment	(436,085)
(3) Contributions	1,853,508
(4) Benefit payments	(1,202,579)
(5) Expenses and fees	(32,223)
(6) Investment increment at 8% for two years	3,187,855
(7) Expected actuarial value on July 1, 2005	22,653,276
(8) Market value on July 1, 2005	22,259,308
(9) Difference: (8) - (7)	(393,968)
(10) Adjustment: 25% x (9)	(98,492)
(11) Actuarial Value on July 1, 2005: (7) + (10)	22,554,784

**SECTION 5**  
**ACCOUNTING INFORMATION SUBMITTED BY THE CITY**

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Market Value July, 1, 2003	17,608,066
Market Value Adjustment	(581,447)
Adjusted Market Value July, 1, 2003	17,026,619
Real Estate Tax - Pension	1,418,790
Personal Property Tax - Pension	203,560
Railroad & Utility Property Tax	21,239
Participant Contributions	208,923
Investment Income	672,673
Gain (Loss) Investment Book Value	4,004,162
Miscellaneous	995
Total Revenues	6,530,342
Pensions & Annuities	1,202,579
Memberships	100
Investment Expense	83,902
Professional Services	29,397
Actuary Services	2,625
Supplies & Equipment	100
Total Disbursements	1,318,703
Adjustment	21,050
Market Value July, 1, 2005	22,259,308

**SECTION 6**  
**ACTUARIAL ACCRUED LIABILITY**

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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 the individual entry-age actuarial cost method. Assumptions, including projected pay increases, were the same as used to determine the Retirement System's level percent-of-payroll 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 entry age actuarial accrued liability was determined as part of an actuarial valuation of the plan as of July 1, 2005. Significant actuarial assumptions used in determining the entry age actuarial accrued liability include (a) a rate of return on the investment of present and future assets of 8% per year compounded annually and, (b) projected salary increases of 5% per year compounded annually ( 3-1/2% for inflation and 1.5% for promotion and merit), and c) Participants and beneficiaries in pay status prior to July 1, 1987 are assumed to receive 4% cost-of-living increases per year. After July 1, 1987, 5% to age 65.

At July 1, 2005, the assets in excess of the actuarial accrued liability were \$755,195 determined as follows:

Actuarial Accrued Liability	
Active participants (26 vested and 38 non-vested)	\$ 15,610,193
Retired participants and beneficiaries currently receiving benefits ( recipients)	5,728,456
Vested terminated participants not yet receiving benefits ( vested)	<u>460,940</u>
Total Actuarial Accrued Liability	21,799,589
Actuarial Value of Assets (smoothed market value)	<u>22,554,784</u>
Assets in excess of the Actuarial Accrued Liability	<u><u>\$ 755,195</u></u>
Funded Ratio	103%

During the period from July 1, 2003 to July 1, 2005, the System experienced a net change of \$3,910,440 in the actuarial accrued liability. There were no changes in benefit provisions during the prior two years, and there were no material changes in actuarial assumptions. The \$3,910,440 increase was due to demographic changes. Results for the prior valuation were calculated by W. Alfred Hayes and Company.

**SECTION 7**  
**VALUATION RESULTS AND**  
**DETERMINATION OF CONTRIBUTION**

	July 1, 2003	July 1, 2005
(1) Actuarial Present Value of future benefits to:		
(a) Active participants	\$ 20,917,330	\$ 21,169,796
(b) Retired participants and beneficiaries	4,272,833	5,728,456
(c) Vested terminated participants	<u>143,710</u>	<u>460,940</u>
Total	\$ 25,333,873	\$27,359,192
(2) Annual City Normal Cost, adjusted with interest to the end of the Plan year	657,903	704,403
(3) Covered compensation	3,336,718	3,646,061
(4) Annual City Normal Cost Accrual Rate:	19.7%	19.3%
(2) / (3)		
(5) Actuarial present value of future City Normal Costs	\$ 6,461,576	\$ 4,636,559
(6) Actuarial Present Value of future employee contributions	983,148	923,044
(7) Actuarial Accrued Liability: (1) – (5) – (6)	17,889,149	21,799,589
(8) Actuarial Value of Assets	19,282,800	22,554,784
(9) Unfunded Actuarial Accrued Liability:	0	0
(7) – (8), not less than zero		
(10) Annual payment to amortize the Unfunded Actuarial Accrued Liability over 30 years from July 1	0	0
(11) Actuarially required contribution required to fund Plan: (2) + (10)	657,903	704,403