OFFICE OF THE TOWN MANAGER



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Town of Shrewsbury MASSACHUSETTS 01545-5398

June 2, 2008

To: Board of Selectmen Finance Committee

From: Daniel J. Morgado

Re: Retirement Valuation Study

Attached is the most valuation report recently received by the Retirement Board. Our funding ratio has increased from 71.3% to 77.0%.

Due to an improvement in the funding ratio it is possible to reduce the FY 2010 appropriation and still meet the 2022 funding goal. My recommendation is that we level fund the appropriation in FY 2010 placing additional funding into the system in the event the 1/1/2010 valuation realizes any erosion which in turn would cause for the FY 2011 appropriation to increase dramatically.

Ms. Thompson and I are available to answer any questions.

Cc Mary Thompson

Shrewsbury Retirement System as of January 1, 2008 Primary Results Comparison

| | | Change as a | | |
|---|--------------------|--------------------|--------------|------------|
| | January 1. 2006 | January 1, 2008 | (Annualized) | FY 2010 |
| Actives | 615 | 648 | 2.6% | |
| Retirees and Beneficiaries | 195 | 191 | -1.0% | |
| Inactives (Refunds) | 137 | 112 | -9.6% | |
| Disabled | <u>30</u> | <u>30</u> | 0.0% | |
| Total | 977 | 981 | 0.2% | |
| Total Payroll | 19.896.839 | 22.402.987 | 6.1% | 23.411.121 |
| Average Annual Salary | 32.353 | 34.573 | 3.4% | |
| Average Past Service | 9.5 | 9.7 | | |
| Average Attained Age | 44.7 | 44.5 | | |
| Employee Normal Cost | 1,586.468 | 1.819.080 | 7.1% | 1.930.266 |
| % of Payroll | 8.0% | 8.1% | | 8.2% |
| Employer Normal Cost | 873.568 | 946,660 | 4.1% | 959.932 |
| % of Payroll | 4.4% | 4.2% | | 4.1% |
| Administrative Expense | 85.000 | 100.000 | 8.5% | 104.500 |
| % of Payroll | 0.4% | 0.4% | | 0.4% |
| Total Normal Cost | 2.545,036 | 2.865.740 | 6.1% | 2,994,698 |
| % of Payroll | 12.8% | 12.8% | | 12.8% |
| Total Actuarial Accrued Liability | 75.979.303 | 85.256.692 | 5.9% | |
| Assets - Market Value | 54.782.535 | 67.257.220 | 10.8% | |
| Assets - Actuarial Value | 54.147.807 | 65,665,411 | 10.1% | |
| Funded Ratio | 71.3% | 77.0% | 4.0% | |
| Market Based | 72.1% | 78.9% | 4.6% | |
| Total Unfunded Accrued Liability | 21,831,496 | 19.591.281 | -5.3% | |
| Expected Unfunded Accrued Liability | | 22.212.082 | | |
| (Gain)/Loss | | (2.620.801) | | |
| Asset (Gain)/Loss | | (1.691.701) | | |
| Liability (Gain)/Loss | | (929.100) | | |
| Salary Increases | | (1.302.488) | | |
| New Participants | | 954.065 | | |
| Active - Retirements | | (1.106.820) | | |
| Active - Mortality | | (103.907) | | |
| Active - Disabilities | | (09.280) | | |
| Inactive - Mortality and data adjustments | | 155,724 416 206 | | |
| Other, including data changes, ser | vice purchases etc | 129 400 | | |
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Shrewsbury Retirement System as of January 1, 2008 Analysis of Funding Alternatives

| | | FY 2009 | FY 2010 |
|--|-----------------------------|---------------------------------|---------------------------------|
| Employer Appropriations under current funding schedule As a percent of pay | \$3,119,214 14.4% | \$3,231,124 14.2% | |
| Option A Employer Normal Cost Total Unfunded Accrued Liabilities | \$19.591.281 | \$1.046.660 | \$1.064.432 |
| Prior Active unfunded accrued liability 14 years remaining as of January 1, 2008 (2022) 8.500% interest and 4.5% increasing payments | 22.212.082 | 2.002.310 | 2.092.414 |
| Unfunded liability for current (gains)/losses 14 years remaining as of January 1, 2008 (2022) 8.500% interest and 4.5% increasing payments | (2.620.801) | (236.252) | (246.884) |
| Total Required Employer Appropriations with interest adjustment for the complete contribution on July 1. As a percent of pay | | 2.812.717 2,949,178 13.2% | 2.909.962 3,051,140 13.0% |
| If FY 2009 appropriation unchanged: | | 3.119.214 | 3.033.535 |
| Option B Employer Normal Cost Total Unfunded Accrued Liabilities | \$19.591.281 | \$1,046.660 | \$1.064.432 |
| Total unfunded accrued liability 14 years remaining as of January 1. 2008 (2022) 8.500% interest and 2.5% increasing payments | 19.591.281 | 1.973.167 | 2.022,496 |
| Total Required Employer Appropriations with interest adjustment for the complete contribution on July 1. As a percent of pay | | 3.019.827 3.166.335 14.1% | 3.086.928 3,236.691 13.8% |
| If FY 2009 appropriation unchanged: | | 3.119.214 | 3.242,101 |

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Shrewsbury Retirement System as of January 1, 2008 Analysis of Funding Alternatives

| Employer Appropriations under current funding schedule $$3,119,214$ $$3,231,124$ As a percent of pay 14.4% 14.2% As a percent of pay 14.4% 14.2% Option C $$1.046.660$ $$1.064.432$ Total Unfunded Accrued Liabilities $$19,591.281$ $$1.046.660$ Initial unfunded accrued liability $19,591.281$ $1.869.473$ 13 years remaining as of January 1, 2008 (2021) 8.500% interest and 4.5% increasing payments $1.869.473$ Total Required Employ er Appropriations $2.916,133$ $3.018.031$ with interest adjustment for the complete contribution on July 1. $3.077.611$ $3.164.452$ As a percent of pay $3.179.214$ $3.157.662$ Option D 8.500% interest and 4.5% increasing payments $19.591.281$ Initial unfunded accrued Liabilities $$19.591.281$ Initial unfunded accrued Liabilities $$1.990.493$ 2.080.065 $3.037.153$ Total Required Employ er Appropriations $3.037.153$ With interest adjustment for the complete contribution on July 1. $3.184.502$ As a percent of pay 14.2% If FY 2009 appropriation unchanged: $3.179.214$ If Pi 2009 appropriation unchanged: $3.179.214$ If Pi 2009 appropriat | | | FY 2009 | FY 2010 |
|--|--|-----------------------------|-----------------------------|-------------|
| Option C $\$1.046.660$ $\$1.064.432$ Total Unfunded Accrued Liabilities $\$19.591.281$ Initial unfunded accrued liability $19.591.281$ Initial unfunded accrued liability $19.591.281$ I 3 years remaining as of January 1, 2008 (2021) $\$.500\%$ interest and 4.5% increasing payments $1.869.473$ Total Required Employ er Appropriations $2.916.133$ $3.018.031$ with interest adjustment for the complete contribution on July 1. $3.057.611$ $3.164.452$ As a percent of pay $3.179.214$ $3.757.662$ Option D $\$.1046.660$ $\$.1.064.432$ Employ er Normal Cost $\$.19.591.281$ Initial unfunded accrued Liabilities $\$.19.591.281$ Initial unfunded accrued Liabilities $\$.19.591.281$ Initial unfunded accrued Liability $19.591.281$ 12 years remaining as of January 1, 2008 (2020) $\$.500\%$ interest and 4.5% increasing paymentsTotal Required Employ er Appropriations $3.037.153$ $3.0141.497$ $3.184.502$ Total Required Employ er Appropriations $3.037.153$ $3.1141.497$ 14.2% it interest adjustment for the complete contribution on July 1. $3.184.502$ As a percent of pay 14.2% If FY 2009 appropriation unchanged: $3.179.214$ $3.179.214$ $3.304.769$ | Employer Appropriations under current funding schedule As a percent of pay | \$3,119,214 14.4% | \$3,231,124 14.2% | |
| Employer Normal Cost $$1.046.660$ $$1.064.432$ Total Unfunded Accrued Liabilities $$19.591.281$ $19.591.281$ Initial unfunded accrued liability $19.591.281$ 1869.473 $1.953.599$ Total Required Employ er Appropriations $2.916.133$ $3.018.031$ with interest adjustment for the complete contribution on July 1. $3.057.611$ $3.164.452$ As a percent of pay 13.6% 13.5% If FY 2009 appropriation unchanged: $3.179.214$ $3.157.662$ Option DEmployer Normal Cost $$1.046.660$ $$1.064.432$ Total Unfunded accrued Liabilities $$19.591.281$ $$1.046.660$ $$1.064.432$ Initial unfunded accrued Liabilities $$19.591.281$ $$1.046.660$ $$1.064.432$ Total Unfunded accrued Liabilities $$19.591.281$ $$1.990.493$ $$2.080.065$ Total Required Employ er Appropriations $$0.37.153$ $$3.144.497$ with interest adjustment for the complete contribution on July 1. $$3.037.153$ $$3.144.497$ As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: $$3.119.214$ $$3.304.769$ | Option C | | | |
| Total Unfunded Accrued Liabilities\$19,591,281Initial unfunded accrued liability19,591,28113 years remaining as of January 1, 2008 (2021)19,591,2818,500% interest and 4.5% increasing payments1.869,473Total Required Employ er Appropriations2,916,133with interest adjustment for the complete contribution on July 1.3,057,611As a percent of pay13,6% $lf FY 2009 appropriation unchanged:3,119,214Option D$1,046,660Employ er Normal Cost$19,591,281Total Unfunded accrued Liabilities$19,591,281Initial unfunded accrued Liabilities$19,591,28112 years remaining as of January 1, 2008 (2020)3,037,1538,500% interest and 4,5% increasing payments1,990,4932,080,0653,037,153Total Required Employ er Appropriations3,037,1533,144,4973,297,053As a percent of pay1,4,2\%lf FY 2009 appropriation unchanged:3,179,2743,179,2743,304,769$ | Employer Normal Cost | | \$1.046.660 | \$1.064.432 |
| Initial unfunded accrued liability19,591.28113 years remaining as of January 1, 2008 (2021)1.869.4731.953.5998,500% interest and 4.5% increasing payments1.869.4731.953.599Total Required Employ er Appropriations2.916.1333.018.031with interest adjustment for the complete contribution on July 1.3.057.6113.164.452As a percent of pay13.6%13.5%If FY 2009 appropriation unchanged: $3.1/9.214$ $3.157.662$ Option DEmployer Normal Cost\$1.046.660\$1.064.432Total Unfunded Accrued Liabilities\$19,591.281\$1.046.660Initial unfunded accrued liability19.591.2811.990.4932.080.065Total Required Employ er Appropriations $3.037.153$ $3.144.497$ with interest adjustment for the complete contribution on July 1. $3.164.502$ $3.037.153$ Initial unfunded accrued Liabilities $1.990.493$ $2.080.065$ Total Required Employ er Appropriations $3.037.153$ $3.144.497$ with interest adjustment for the complete contribution on July 1. $3.184.502$ $3.297.053$ As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: $3.1/9.2/4$ $3.047.69$ | Total Unfunded Accrued Liabilities | \$19.591.281 | | |
| 13 years remaining as of January 1, 2008 (2021)8.500% interest and 4.5% increasing payments $1.869.473$ $1.953.599$ Total Required Employ er Appropriations with interest adjustment for the complete contribution on July 1.As a percent of pay $2.916.133$ $3.018.031$ IS.609 appropriation unchanged:Option DEmploy er Normal Cost $3.119.214$ $3.157.662$ Total Unfunded Accrued LiabilitiesS19.591.281Initial unfunded accrued liability19.591.281Initial unfunded accrued liability1.990.4932.080.065Total Required Employ er AppropriationsNormal CostS1.046.660\$1.046.660\$1.046.660\$1.044.432< | Initial unfunded accrued liability | 19.591.281 | | |
| 8.500% interest and 4.5% increasing payments $1.869.473$ $1.953.599$ Total Required Employer Appropriations with interest adjustment for the complete contribution on July 1. As a percent of pay $2.916.133$ $3.018.031$ $3.057.611$ $3.018.031$ $3.164.452$ 13.6% <i>If FY 2009 appropriation unchanged:</i> $3.119.214$ $3.157.662$ Option D | 13 years remaining as of January 1, 2008 (2021) | | | |
| Total Required Employ er Appropriations with interest adjustment for the complete contribution on July 1. $2.916.133$ $3.057.611$ $3.018.031$ $3.164.452$ 13.6% As a percent of pay 13.6% 13.5% If FY 2009 appropriation unchanged: $3.119.214$ $3.157.662$ Option D Employer Normal Cost Total Unfunded Accrued Liabilities $$19.591.281$ $$1.046.660$ Initial unfunded accrued liability 12 years remaining as of January 1. 2008 (2020) 8.500% interest and 4.5% increasing payments $1.990.493$ $2.080.065$ Total Required Employ er Appropriations with interest adjustment for the complete contribution on July 1. $3.037.153$ $3.114.497$ $3.144.497$ 14.2% If FY 2009 appropriation unchanged: $3.179.214$ $3.3047.699$ | 8.500% interest and 4.5% increasing payments | | 1.869.473 | 1,953,599 |
| with interest adjustment for the complete contribution on July 1. 3.057.6113.164.452 As a percent of pay13.6%13.6%13.6%13.6% <i>If FY 2009 appropriation unchanged:</i> 3.179.2143.164.452 Option DEmployer Normal Cost\$1.046.660\$1.046.660\$1.064.432Total Unfunded Accrued Liability19.591.2811.990.4932.080.065Total Required Employ er Appropriations 3.037.1533.144.497 with interest adjustment for the complete contribution on July 1. 3.19.2143.007.1533.14.49714.1% <i>If FY 2009 appropriation unchanged:</i> 3.119.2143.047.769 | Total Required Employer Appropriations | | 2,916,133 | 3.018.031 |
| As a percent of pay 13.6% 13.5% If FY 2009 appropriation unchanged: $3.119.214$ $3.157.662$ Option D $3.119.214$ $3.157.662$ Employ er Normal Cost $\$1.046.660$ $\$1.064.432$ Total Unfunded Accrued Liabilities $\$19.591.281$ Initial unfunded accrued liability $19.591.281$ 12 years remaining as of January 1. 2008 (2020) $\$.500\%$ interest and 4.5% increasing payments $1.990.493$ $2.080.065$ Total Required Employ er Appropriations $3.037.153$ $3.144.497$ with interest adjustment for the complete contribution on July 1. $3.184.502$ $3.297.053$ As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: $3.119.214$ $3.304.769$ | with interest adjustment for the complete contribution on July 1. | | 3,057,611 | 3,164,452 |
| If FY 2009 appropriation unchanged:3.119.2143.157.662Option D Employer Normal Cost\$1.046.660\$1.064.432Total Unfunded Accrued Liabilities\$19,591.281\$1.046.660Initial unfunded accrued liability19.591.281\$1.990.49312 years remaining as of January 1. 2008 (2020) 8.500% interest and 4.5% increasing payments1.990.4932.080.065Total Required Employer Appropriations with interest adjustment for the complete contribution on July 1.3.037.1533.144.497Jf FY 2009 appropriation unchanged:3.119.2143.304.769 | As a percent of pay | | 13.6% | 13.5% |
| Option D $\$1,046,660$ $\$1,064,432$ Fotal Unfunded Accrued Liabilities $\$19,591,281$ $\$1,046,660$ $\$1,064,432$ Initial unfunded accrued liability $19,591,281$ 12 years remaining as of January 1, 2008 (2020) $\$,500\%$ interest and 4.5% increasing payments $1.990,493$ $2.080,065$ Total Required Employer Appropriations $3.037,153$ $3.144,497$ with interest adjustment for the complete contribution on July 1. $3,184,502$ $3.297,053$ As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: $3.119,214$ $3.304,769$ | If FY 2009 appropriation unchanged: | | 3.119.214 | 3,157.662 |
| Employer Normal Cost\$1.046.660\$1.064.432Total Unfunded Accrued Liabilities\$19,591.281\$10,591.281Initial unfunded accrued liability19,591.281\$1,990.493\$2.080,06512 years remaining as of January 1, 2008 (2020) 8,500% interest and 4.5% increasing payments1.990,493\$2.080,065Total Required Employer Appropriations with interest adjustment for the complete contribution on July 1.3.037,153 3.144.4973.144.497 3.297,053As a percent of pay14.2%14.1%If FY 2009 appropriation unchanged:3.119,2143.304,769 | Option D | | | |
| Total Unfunded Accrued Liabilities\$19,591.281Initial unfunded accrued liability19,591.28112 years remaining as of January 1, 2008 (2020)19,591.2818,500% interest and 4.5% increasing payments1,990,4932,080,065Total Required Employer Appropriations3,037,1533,184,5023,144,497with interest adjustment for the complete contribution on July 1.3,184,502As a percent of pay14,2%If FY 2009 appropriation unchanged:3,119,2143,119,2143,304,769 | Employer Normal Cost | | \$1.046.660 | \$1.064.432 |
| Initial unfunded accrued liability 19.591.281 12 years remaining as of January 1. 2008 (2020) 1.990.493 8.500% interest and 4.5% increasing payments 1.990.493 Total Required Employer Appropriations 3.037.153 with interest adjustment for the complete contribution on July 1. 3.184,502 As a percent of pay 14.2% If FY 2009 appropriation unchanged: 3.119.214 | Total Unfunded Accrued Liabilities | \$19,591.281 | | |
| 12 years remaining as of January 1, 2008 (2020) 8.500% interest and 4.5% increasing payments 1.990,493 2.080,065 Total Required Employer Appropriations 3.037,153 3.144.497 with interest adjustment for the complete contribution on July 1. 3.184,502 3.297,053 As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: 3.119,214 3.304,769 | Initial unfunded accrued liability | 19.591.281 | | |
| 8.500% interest and 4.5% increasing payments 1.990.493 2.080,065 Total Required Employer Appropriations 3.037.153 3.144.497 with interest adjustment for the complete contribution on July 1. 3.184,502 3.297,053 As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: 3.119.214 3.304.769 | 12 years remaining as of January 1, 2008 (2020) | | | |
| Total Required Employer Appropriations $3.037.153$ $3.144.497$ with interest adjustment for the complete contribution on July 1. $3,184,502$ $3.297,053$ As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: $3.119,214$ $3.304.769$ | 8.500% interest and 4.5% increasing payments | | 1.990.493 | 2,080,065 |
| with interest adjustment for the complete contribution on July 1. 3,184,502 3,297,053 As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: 3,119,214 3,304,769 | Total Required Employer Appropriations | | 3.037.153 | 3.144.497 |
| As a percent of pay 14.2% 14.1% If FY 2009 appropriation unchanged: 3,119,214 3,304,769 | with interest adjustment for the complete contribution on July 1. | | 3,184,502 | 3,297,053 |
| <i>If FY 2009 appropriation unchanged:</i> 3,119,214 3,304,769 | As a percent of pay | | 14.2% | 14.1% |
| | If FY 2009 appropriation unchanged: | | 3,119,214 | 3,304,769 |



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Actuarial Value of Assets

The actuarial value of assets is determined by projecting the market value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (8.5%) and accounting for deposits and disbursements with interest at the assumed rate of return. An adjustment is then applied to recognize the difference between the actual investment return and expected return over a five year period. This preliminary actuarial value is not allowed to differ from the market value of assets by more than 10%. The calculation of the actuarial value of assets as of January 1, 2008 is presented in Table V.

| Table V | | | | |
|----------------|--|-----------------|--|--|
| (1) | Market value at January 1, 2007 | January 1, 2008 | | |
| (1) | Narket value at January 1, 2007 | \$01,142,741 | | |
| (2) | 2007 Contributions | \$5,508,800 | | |
| (3) | 2007 Payments Natintement a divertment at 8 50(an (1) (2) and (2) to December 21, 2007 | (\$4,921,131) | | |
| (4) | Net interest adjustment at 8.5% on (1), (2), and (3) to December 31, 2007 | \$5,210,159 | | |
| (\mathbf{S}) | Expected market value on January 1, 2008 $(1) + (2) + (3) + (4)$ | \$00,800,575 | | |
| | (1) + (2) + (3) + (4) | | | |
| (6) | Actual market value on January 1, 2008 | \$67,257,220 | | |
| (7) | 2007 (Gain) / Loss | (\$450,645) | | |
| (8) | 80% of 2007 (Gain) / Loss | (\$360,516) | | |
| (9) | 2006 (Gain) / Loss | (\$1,927,585) | | |
| (10) | 60% of 2006 (Gain) / Loss | (\$1.156,551) | | |
| (11) | 2005 (Gain) / Loss | \$236,959 | | |
| (12) | 40% of 2005 (Gain) / Loss | \$94,783 | | |
| (13) | 2004 (Gain) / Loss | (\$847,628) | | |
| (14) | 20% of 2004 (Gain) / Loss | (\$169.526) | | |
| (15) | Actuarial value on January 1, 2008, $(6) + (8) + (10) + (12) + (14)$ | \$65,665,411 | | |
| | but not less than 90% nor greater than 110% of (6) | \$65.665,411 | | |
| (16) | Ratio of actuarial value to market value | 97.63% | | |
| (17) | Actuarial Value Return for 2006 | 8.63% | | |
| (18) | Actuarial Value Return for 2007 | 11.26% | | |
| (19) | Market Value Return for 2006 | 12.03% | | |
| (20) | Market Value Return for 2007 | 9.23% | | |

Town of Shrewsbury Retirement System



