TOWN OF SHREWSBURY
CONTRIBUTORY RETIREMENT SYSTEM

Actuarial Valuation Report

January 1, 2012

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Report Summary:

Highlights	**January 1, 2010**	**January 1, 2012**
Contributions		
Funding Schedule FY 2013	$3,987,702	$3,987,702
Funding Schedule FY 2014	4,131,663	5,270,842
Funded Ratios		
GAS No. 25	70.8%	68.4%
Participants		
Actives	591	582
Retirees and Beneficiaries	197	209
Inactives	115	106
Disabled	30	28
Total	933	925
Payroll		
Payroll of Active Members	$22,460,537	$22,671,647
Average Payroll	38,004	38,955
Normal Cost		
Employer	698,514	767,981
Employee	1,853,530	1,900,439
Administrative Expenses	120,000	120,000
Total	2,672,044	2,788,420
Actuarial Accrued Liabilities		
Actives	49,382,314	52,546,256
Retirees, Beneficiaries, Disabilities and Inactives	41,070,523	52,540,155
Total	91,059,541	105,086,411
Actuarial Value of Assets	64,467,201	71,863,914
Unfunded Actuarial Accrued Liabilities	$26,592,340	$33,222,497

Introduction

This report presents the Town of Shrewsbury actuarial valuation findings as of January 1, 2012, under the Commonwealth of Massachusetts Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2012.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the Town of Shrewsbury Contributory Retirement System
- Actuarial assumptions approved by the Retirement Board

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2012.

The valuation and forecast do not account for:

- Any subsequent changes in the law
- Chapter 32 of the M.G.L., Section 3(8)(c) transfers between systems
- State-mandated benefits
- Cost-of-living increases granted to retired members between 1982 and 1997. The cost of these benefits has been assumed by the State under Proposition Two and One-Half.

Actuarial Experience

In performing the actuarial valuation, various assumptions are made regarding such factors as mortality, retirement, disability, and withdrawal rates as well as both payroll, salary increases, and investment returns. A comparison of the current valuation and the prior valuation is made to determine how closely actual experience corresponded to anticipated occurrences. This analysis of the system provides insight into the overall quality of the actuarial assumptions and helps explain any change in the annual appropriation.

During the preceding two years, the total unfunded actuarial accrued liability increased by 24.9% to $33,222,497. The increase is the result of net unfavorable actuarial experience. The actuarial value of assets for 2010 and 2011 had returns of 9.92% and 1.74%, respectively. The sources of the (gain)/loss are as follows:

Investment	3,522,118
Salary	(798,272)
Retiree Mortality	1,030,581
Active Decrements (Retirement)	334,827
Active Decrements (Disability)	(487,258)
Active Decrements (Termination)	839,401
Active Decrements (Death)	(113,146)
New Entrants	414,836
Other (Data corrections, Section 3(8)(c), Service buybacks)	(958,781)
Total (gain)/loss	3,784,306
Change in Assumptions	3,887,585
Net Change	7,671,891

Actuarial Costs and Liabilities:

Normal Costs

The normal cost is the sum of the individual normal costs determined for each member as if the assumptions underlying the cost determinations had been exactly realized. An individual normal cost represents that part of the cost of a member's future benefits which are assigned to the current year as if the costs are to remain level as a percentage of the member's pay. Benefits payable under all circumstances (i.e., retirement, death, disability, and terminations) are included in this calculation. Anticipated employee contributions to be made during the year are subtracted from the total normal cost to determine employer normal cost. The total normal cost is divided by total payroll to determine the normal cost as a percent of pay. The normal cost is shown in Table I.

Table I

	January 1, 2010	January 1, 2012
Superannuation	$1,714,742	$1,816,428
Termination	293,965	309,503
Death	145,107	128,931
Disability	398,230	413,558
Administrative Expenses	120,000	120,000
Total Normal Cost	2,672,044	2,788,420
% of Pay	11.9%	12.3%
Employee Contributions	1,853,530	1,900,439
% of Pay	8.3%	8.4%
Employer Normal Cost	$818,514	$887,981
% of Pay	3.6%	3.9%

Present Value of Actuarial Accrued Liabilities

The actuarial accrued liabilities (AAL) represents today's value of all benefits based on the past service of the actives and inactives. The AAL can be compared to the assets to determine the funded status of the Plan. The value of these earned benefits is shown in Table II below.

Table II

	January 1, 2010	January 1, 2012
Actives		
Superannuations	$43,793,576	$46,989,144
Termination	1,077,337	1,180,460
Death	1,720,497	1,511,560
Disability	2,790,904	2,865,092
Retirees and Inactives		
Retirees and Beneficiaries	32,995,293	43,621,385
Terminated (Refund)	606,704	884,224
Disabled	8,075,230	8,034,546
Total	$91,059,541	$105,086,411

Present Value of Future Benefits

The present value of future benefits represents today's value of all benefits earned by the inactive participants as well as all benefits earned and expected to be earned in the coming years by the active participants. The difference between the present value of future benefits and the present value of actuarial accrued liabilities is the value of benefits to be earned in the coming years. The value of the total expected benefits is shown in Table III.

Table III

	January 1, 2010	January 1, 2012
Actives		
Superannuation	$56,956,673	$61,091,537
Termination	2,253,942	2,447,258
Death	2,796,214	2,459,491
Disability	6,237,749	6,625,764
Retirees and Inactives		
Retirees and Beneficiaries	32,995,293	43,621,385
Terminated (Refund)	606,704	884,224
Disabled	8,075,230	8,034,546
Total	$109,921,805	$125,164,205

Funded Status and Appropriations:

Market Value of Plan Assets

The trust fund composition on a market value basis is shown in Table IV.

Table IV

	January 1, 2010	January 1, 2012
Cash equivalents	$3,678,565	$2,887,659
Short term investments	0	0
Fixed income securities	6,632,819	7,540,066
Equities	15,930,317	19,118,022
International	3,903,612	2,901,337
Real Estate	0	1,661,320
Venture Capital	0	0
Other	28,500,787	32,161,047
Accounts receivable	5,661	203,240
Accounts payable	(45,261)	(379,900)
Accrued income	47	4
Total Market Value	$58,606,547	$66,092,795
Total Actuarial Value	$64,467,201	$71,863,914

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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 (8.25%) 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, 2012 is presented in Table V.

Table V

		January 1, 2012
(1)	Market value at January 1, 2011	$66,133,912
(2)	2011 Contributions	$6,296,840
(3)	2011 Payments	($6,176,772)
(4)	Net interest adjustment at 8.25% on (1), (2), and (3) to December 31, 2011	$5,626,485
(5)	Expected market value on January 1, 2012 (1) + (2) + (3) + (4)	$71,880,465
(6)	Actual market value on January 1, 2012	$66,092,795
(7)	2011 (Gain) / Loss	$5,787,670
(8)	80% of 2011 (Gain) / Loss	$4,630,136
(9)	2010 (Gain) / Loss	($2,888,770)
(10)	60% of 2010 (Gain) / Loss	($1,733,262)
(11)	2009 (Gain) / Loss	($5,188,581)
(12)	40% of 2009 (Gain) / Loss	($2,075,432)
(13)	2008 (Gain) / Loss	$24,748,382
(14)	20% of 2008 (Gain) / Loss	$4,949,676
(15)	Actuarial value on January 1, 2012, (6) + (8) + (10) + (12) + (14) but not less than 90% nor greater than 110% of (6)	$71,863,914
(16)	Ratio of actuarial value to market value	108.73%
(17)	Actuarial Value Return for 2010	9.92%
(18)	Actuarial Value Return for 2011	1.74%
(19)	Market Value Return for 2010	13.44%
(20)	Market Value Return for 2011	-0.24%

Unfunded Actuarial Accrued Liabilities

Under the Entry Age Normal Actuarial Cost Method, the Actuarial Accrued Liability represents what the accumulated assets would have been as of the valuation date if:

- current plan provisions and assumptions had always been in effect,
- experience conformed exactly to assumptions, and
- the normal cost had been contributed each year since inception.

The actuarial value of the Fund's assets as of the end of the prior year are subtracted from the Actuarial Accrued Liability (AAL) to determine the Unfunded Actuarial Accrued Liability (UAAL) as of the valuation date. Over time, annual pension contributions will accumulate Plan assets equal to the AAL, and the UAAL will be eliminated. Thereafter, annual contributions equal to the normal cost will keep the Plan's assets and liabilities in balance. The UAAL is developed in Table VI.

Table VI

	January 1, 2010	January 1, 2012
Actuarial Accrued Liability	$91,059,541	$105,086,411
Actuarial Assets	64,467,201	71,863,914
Unfunded Actuarial Accrued Liability	$26,592,340	$33,222,497
Funded Status	70.8%	68.4%

Appropriations

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Section 22D of Chapter 32 of the Massachusetts General Laws. These amounts were calculated to comply with the June 30, 2030, full funding mandate for all accrued liabilities. The pension appropriation is the sum of the:

- Employer normal cost,
- Increasing amortization of the unfunded actuarial accrued liability by June 30, 2022
  $ 33,222,497 over 10 years with 4.5% increasing payments
- Interest adjustment for payments deposited at the various times in the year

The pension appropriation is shown in Table VII.

Table VII

	January 1, 2010	January 1, 2012
Normal cost	$818,514	$887,981
Amortization payment of the prior accrued liability	1,887,944	2,950,138
Amortization payment of current (gains)/losses	782,463	885,816
Total cost	$3,488,921	$4,723,935
% of Pay	15.5%	20.8%
Fiscal 2013 cost	$3,987,702	$3,987,702
Fiscal 2014 cost	$4,131,663	$5,270,842

Appropriation Forecast

The following exhibit forecasts employer and employee contributions over the next 32 years under the adopted funding schedule.

Note that the forecast is based upon an "open group" method. This method assumes that sufficient employees will be hired each year to keep the number constant. The total payroll of the system is expected to increase 4.5% per year. The employee contribution rate is expected to increase to 10.5% by 2042 as members contributing base percentages 5%, 7%, and 8% are replaced by new members, whose base contribution is 9%. Payments are assumed to be made at the beginning of the year.

The employer total cost is expected to increase during the next 9 years until the unfunded liabilities are completely paid off, at which time only the normal cost will remain. The total cost represents 22.4% of payroll, increasing to 22.5% for FY 2022, leaving only a normal cost of about 3.3% thereafter. The decrease in the cost as a percentage of payroll is a result of the increase in member deductions.

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Appropriation Forecast

Fiscal Year Ending	Payroll*	Employee Contribution	Employer Normal Cost with Interest	Amortization Payments with Interest	Employer Total Cost with Interest	Employer Total Cost % of Payroll	Funded Ratio %**
2013	$22,671,647	$1,900,439	$928,802	$3,058,900	$3,987,702	17.6	67.5
2014	$23,578,513	$1,993,673	$947,945	$4,322,897	$5,270,842	22.4	70.4
2015	$24,521,653	$2,091,326	$967,135	$4,523,674	$5,490,809	22.4	73.5
2016	$25,502,520	$2,193,600	$986,342	$4,727,240	$5,713,582	22.4	76.7
2017	$26,522,620	$2,300,711	$1,005,539	$4,939,965	$5,945,504	22.4	79.8
2018	$27,583,525	$2,412,881	$1,024,694	$5,162,264	$6,186,958	22.4	83.0
2019	$28,686,866	$2,530,343	$1,043,771	$5,394,566	$6,438,337	22.4	86.2
2020	$29,834,341	$2,653,341	$1,062,736	$5,637,321	$6,700,057	22.5	89.5
2021	$31,027,714	$2,782,131	$1,081,548	$5,891,001	$6,972,549	22.5	92.9
2022	$32,268,823	$2,916,979	$1,100,164	$6,156,096	$7,256,260	22.5	96.4
2023	$33,559,576	$3,058,163	$1,118,540	$0	$1,118,540	3.3	100.0
2024	$34,901,959	$3,205,974	$1,136,624	$0	$1,136,624	3.3	100.0
2025	$36,298,037	$3,360,718	$1,154,367	$0	$1,154,367	3.2	100.0
2026	$37,749,959	$3,522,711	$1,171,709	$0	$1,171,709	3.1	100.0
2027	$39,259,957	$3,692,287	$1,188,593	$0	$1,188,593	3.0	100.0
2028	$40,830,355	$3,869,792	$1,204,952	$0	$1,204,952	3.0	100.0
2029	$42,463,570	$4,055,590	$1,220,718	$0	$1,220,718	2.9	100.0
2030	$44,162,112	$4,250,061	$1,235,818	$0	$1,235,818	2.8	100.0
2031	$45,928,597	$4,453,600	$1,250,172	$0	$1,250,172	2.7	100.0
2032	$47,765,741	$4,666,622	$1,263,698	$0	$1,263,698	2.6	100.0
2033	$49,676,370	$4,889,560	$1,276,305	$0	$1,276,305	2.6	100.0
2034	$51,663,425	$5,122,867	$1,287,899	$0	$1,287,899	2.5	100.0
2035	$53,729,962	$5,367,014	$1,298,378	$0	$1,298,378	2.4	100.0
2036	$55,879,161	$5,622,497	$1,307,635	$0	$1,307,635	2.3	100.0
2037	$58,114,327	$5,889,832	$1,315,555	$0	$1,315,555	2.3	100.0
2038	$60,438,900	$6,169,557	$1,322,017	$0	$1,322,017	2.2	100.0
2039	$62,856,456	$6,462,236	$1,326,890	$0	$1,326,890	2.1	100.0
2040	$65,370,715	$6,768,459	$1,330,039	$0	$1,330,039	2.0	100.0
2041	$67,985,543	$7,088,840	$1,331,316	$0	$1,331,316	2.0	100.0
2042	$70,704,965	$7,424,021	$1,330,567	$0	$1,330,567	1.9	100.0
2043	$73,533,163	$7,720,982	$1,383,789	$0	$1,383,789	1.9	100.0
2044	$76,474,490	$8,029,821	$1,439,141	$0	$1,439,141	1.9	100.0

* Calendar basis

** Beginning of Fiscal Year

GASB Statements No. 25 and No. 27

Effective for periods beginning after June 15, 1997, the Governmental Accounting Standards Board (GASB) requires the disclosure of pension related liabilities for public employer financial statements in accordance with Statements 25 and 27. These statements, which replace GASB Statement No. 5, must be adhered to by any public employee retirement system that follows Generally Accepted Accounting Principles (GAAP).

These disclosures are intended to establish a reporting framework that distinguishes between:

- current financial information about plan assets and financial activities,
- actuarially determined information from a long-term perspective,
- the funded status of the plan, and
- progress being made in accumulating sufficient assets to pay benefits when due.

Footnote disclosures required by GASB Statement No. 25 and 27 include a description of the plan, a summary of significant accounting policies, and information about contributions, legally required reserves, and investment concentrations. As a result of the oversight of the Public Employees Retirement Administration Commission (PERAC) and the conversion of unpaid contributions to pension related debt, the Net Pension Obligation (NPO) as required by Statement No. 27 will effectively always be equal to $0. The required disclosure information is shown in Table VIII.

Table VIII

		January 1, 2010	January 1, 2012
(1)	Actuarial Accrued Liability	$91,059,541	$105,086,411
(2)	Actuarial Value of Assets	64,467,201	71,863,914
(3)	Unfunded Actuarial Accrued Liability	26,592,340	33,222,497
(4)	Funded Ratio (2)/(1)	70.8%	68.4%
(5)	Covered Payroll	$22,460,537	$22,671,647
(6)	UAAL as a percentage of payroll: (3)/(5)	118.4%	146.5%
(7)	Annual Required Contribution (ARC)	$3,119,214	$3,987,702
(8)	Net Pension Obligation	$0	$0

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PERAC Annual Statement
APPENDIX PAGE 3
ACTUARIAL VALUATION AND ASSUMPTIONS

The most recent actuarial valuation of the System was prepared by Sherman Actuarial Services as of January 1, 2012.

The normal cost for employees on that date was:	$1,900,439	8.4% of pay
The normal cost for the employer was:	767,981	3.4% of pay

The actuarial liability for active members was:	$52,546,256
The actuarial liability for retired and inactive members was:	52,540,155
Total actuarial accrued liability:	105,086,411
System assets as of that date:	71,863,914
Unfunded actuarial accrued liability:	$33,222,497

The ratio of system's assets to total actuarial liability was 68.4%

The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	8.00%
Rate of Salary Increase:	3.50%

SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded Actuarial Accrued Liability (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a percent of Covered Payroll (b-a)/c
01/01/12	$71,863,914	$105,086,411	$33,222,497	68.4%	$22,671,647	146.5%
01/01/10	64,467,201	91,059,541	26,592,340	70.8%	22,460,537	118.4%
01/01/08	65,665,411	85,256,692	19,591,281	77.0%	22,402,987	87.4%
01/01/06	54,147,807	75,979,303	21,831,496	71.3%	19,896,839	109.7%
01/01/04	50,857,118	65,276,552	14,419,434	77.9%	17,995,844	80.1%
01/01/02	46,779,157	59,312,723	12,533,566	78.9%	16,773,825	74.7%
01/01/00	48,071,979	49,486,969	1,414,990	97.1%	14,064,649	10.1%
01/01/99	39,201,694	46,718,881	7,517,187	83.9%	13,196,123	57.0%

Attach Copy of Current Approved Funding Schedule

EXHIBITS

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Age/Service Distribution with Salary as of January 1, 2012

Attained Age	Average Salary <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
20-24	20	0	0	0	0	0	0	0	0	20
	21,119	0	0	0	0	0	0	0	0	21,119
25-29	48	10	0	0	0	0	0	0	0	58
	28,993	34,450	0	0	0	0	0	0	0	29,933
30-34	22	24	2	0	0	0	0	0	0	48
	28,734	54,308	61,177	0	0	0	0	0	0	42,873
35-39	7	13	12	2	0	0	0	0	0	34
	43,854	43,902	51,615	46,989	0	0	0	0	0	46,796
40-44	33	17	8	9	5	0	0	0	0	72
	26,868	34,818	47,970	63,223	69,817	0	0	0	0	38,617
45-49	38	25	10	9	13	5	0	0	0	100
	27,309	30,987	53,720	57,793	66,127	52,137	0	0	0	39,901
50-54	23	26	21	6	5	9	5	0	0	95
	22,037	27,258	36,482	54,770	59,706	64,783	78,951	0	0	37,754
55-59	14	17	12	11	13	3	6	4	1	81
	24,665	23,116	29,978	52,162	53,247	72,858	71,751	53,633	99,601	41,077
60-64	7	10	8	3	10	8	3	3	0	52
	24,662	35,626	34,998	54,655	49,440	64,914	65,349	73,407	0	46,208
65-69	1	3	4	0	5	2	0	0	0	15
	19,150	15,084	49,836	0	28,132	39,814	0	0	0	32,269
70+	0	1	2	1	0	0	0	2	0	6
	0	20,090	23,592	60,646	0	0	0	52,552	0	38,837
Total Employees	213	146	79	41	51	27	14	9	1	581
Average Salary	26,861	34,990	41,963	56,345	55,579	61,528	72,951	59,984	99,601	38,919

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Retiree Distribution as of January 1, 2012

	Number of Employees			Total Payments		
Attained Age	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	0	0	0	0	0	0
45-49	2	0	2	49,683	0	49,683
50-54	1	1	2	20,490	16,435	36,926
55-59	8	1	9	339,675	8,270	347,944
60-64	22	10	32	961,969	166,935	1,128,904
65-69	26	19	45	1,066,072	341,106	1,407,178
70-74	5	13	18	125,421	244,859	370,279
75-79	10	16	26	264,124	276,816	540,941
80-84	15	26	41	354,336	244,645	598,981
85-89	2	16	18	31,529	159,556	191,085
90-94	3	9	12	76,389	76,418	152,807
95-99	1	4	5	20390	43,730	64,120
Total	95	115	210	3,310,077	1,578,770	4,888,847
Average (Age/Payment)	69.9	77.7	74.2	34,843	13,728	23,280
Frequency Percent	45.2	54.8	100.0	67.7	32.3	100.0

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Disabled Retiree Distribution as of January 1, 2012

	Number of Employees			Total Payments		
Attained Age	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	1	1	0	20,940	20,940
40-44	1	0	1	37,908	0	37,908
45-49	1	0	1	25,309	0	25,309
50-54	1	1	2	30,546	10,014	40,559
55-59	6	0	6	200,694	0	200,694
60-64	5	0	5	154,854	0	154,854
65-69	4	0	4	93,821	0	93,821
70-74	3	0	3	84,128	0	84,128
75-79	3	0	3	80,914	0	80,914
80-84	0	0	0	0	0	0
85-89	2	0	2	53,273	0	53,273
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
Total	26	2	28	761,448	30,953	792,401
Average (Age/Payment)	65.3	46.3	64.0	29,286	15,477	28,300
Frequency Percent	92.9	7.1	100.0	96.1	3.9	100.0

EXHIBIT 4 - CASHFLOW FORECAST:

The following is a 30 year forecast of benefit payments net of state reimbursable COLA payments, Contribution Income and Investment Returns.

Plan Year Ending	Benefit Payments	Employee Contributions	Employer Contributions	Investment Returns	Net change in plan assets
2012	$5,291,369	$1,900,439	$3,987,702	$6,601,841	$7,198,613
2013	5,668,971	1,993,673	5,270,842	6,228,701	7,824,244
2014	6,055,951	2,091,326	5,490,809	6,842,862	8,369,047
2015	6,484,420	2,193,600	5,713,582	7,505,400	8,928,162
2016	6,925,367	2,300,711	5,945,504	8,212,638	9,533,486
2017	7,329,974	2,412,881	6,186,958	8,970,208	10,240,073
2018	7,727,709	2,530,343	6,438,337	9,785,079	11,026,050
2019	8,172,492	2,653,341	6,700,057	10,661,509	11,842,415
2020	8,584,343	2,782,131	6,972,549	11,605,092	12,775,429
2021	8,958,547	2,916,979	7,256,260	12,625,370	13,840,062
2022	9,351,851	3,058,163	1,118,540	13,521,374	8,346,226
2023	9,751,367	3,205,974	1,136,624	14,178,140	8,769,371
2024	10,091,751	3,360,718	1,154,367	14,871,311	9,294,645
2025	10,431,670	3,522,711	1,171,709	15,606,773	9,869,523
2026	10,777,967	3,692,287	1,188,593	16,388,232	10,491,145
2027	11,140,169	3,869,792	1,204,952	17,219,070	11,153,645
2028	11,461,425	4,055,590	1,220,718	18,104,800	11,919,683
2029	11,755,623	4,250,061	1,235,818	19,053,172	12,783,428
2030	11,996,816	4,453,600	1,250,172	20,073,036	13,779,992
2031	12,223,684	4,666,622	1,263,698	21,173,515	14,880,151
2032	12,414,340	4,889,560	1,276,305	22,363,771	16,115,296
2033	12,549,314	5,122,867	1,287,899	23,655,382	17,516,834
2034	12,657,561	5,367,014	1,298,378	25,060,543	19,068,374
2035	12,691,741	5,622,497	1,307,635	26,593,126	20,831,517
2036	12,688,279	5,889,832	1,315,555	28,268,650	22,785,758
2037	12,688,102	6,169,557	1,322,017	30,100,818	24,904,290
2038	12,632,078	6,462,236	1,326,890	32,105,112	27,262,160
2039	12,531,623	6,768,459	1,330,039	34,300,253	29,867,128
2040	12,409,187	7,088,840	1,331,316	36,705,151	32,716,120
2041	12,779,632	7,424,021	1,330,567	39,319,153	35,294,110

EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2012, and does not take into account any subsequent changes.

1. Administration

Each of the 107 contributory retirement systems for public employees for the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts General Laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

2. Participation

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporary, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

(i) Group 1: Most general employees in State and local government

(ii) Group 2: Certain specified hazardous duty positions

(iii) Group 3: State police officers and inspectors

(iv) Group 4: Local police officers, firefighters, and designated employees of the municipal light department.

For members in more than one group, participation will be proportional.

3. <u>Salary</u>

Salary is defined as gross regular compensation. Salary <u>does not</u> include bonuses, overtime, severance pay, unused sick leave credit, or other similar compensation.

4. <u>Member Contributions</u>

Member contributions vary depending upon date hired as follows:

Date of Hire	**Member Contribution Rate**
Prior to 1975	5.0% of Salary
1975 to 1983	7.0% of Salary
1984 to 1996	8.0% of Salary
1996 and Later plus	9.0% of Salary
1979 and Later	2.0% of Salary in excess of $30,000

5. <u>Average Salary</u>

Average salary is used to determine a participant's benefit. It is defined as the average salary during the three consecutive-year period that produces the highest average. (Alternatively, if a greater amount results, it is the average rate of salary earned during the period or periods, whether or not consecutive, that constitutes the last three years preceding retirement.)

6. <u>Creditable Service</u>

In general, creditable service is awarded during the period in which a member contributes to the retirement system.

7. <u>Service Retirement</u>

a. <u>Eligibility</u>:

For an employee to be eligible for service retirement (also referred to as superannuation), one of the following conditions must be met:

(i) completion of 20 years of service

(ii) for an employee hired prior to January 1, 1978, attainment of age 55 as an active member

(iii) for an employee hired on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service

(iv) if an employee is a State Police officer (Group 3), attainment of age 50

b. Benefit Amount:

The retirement allowance is determined as a product of the participant's Benefit Rate times Average Salary times Creditable Service, where Benefit Rate is determined from the following table:

Age at Retirement	Percentage of Average Salary Group 1	Group 2	Group 4
65 or Over	.025	.025	.025
64	.024	.025	.025
63	.023	.025	.025
62	.022	.025	.025
61	.021	.025	.025
60	.020	.025	.025
59	.019	.024	.025
58	.018	.023	.025
57	.017	.022	.025
56	.016	.021	.025
55	.015	.020	.025
54	.014	.014	.024
53	.013	.013	.023
52	.012	.012	.022
51	.011	.011	.021
50	.010	.010	.020
49	.009	.009	.019
48	.008	.008	.018
47	.007	.007	.017
46	.006	.006	.016
45	.005	.005	.015
44	.004	.004	.004
43	.003	.003	.003
42	.002	.002	.002
41	.001	.001	.001

For Group 3 (State Police), the benefit is 50% of the participant's final year's rate of regular salary, plus an additional 1% for each year of service in excess of 20 years. In addition, for veterans (all groups) there is an additional benefit of $15 per year for each year of service, up to a maximum of 20 years of service.

8. Deferred Vested Retirement

a. Eligibility:

A participant who has completed ten or more years of creditable service is eligible for a deferred vested retirement benefit. If termination is involuntary, the participant is vested after six years.

b. Benefit Amount:

The participant's accrued benefit is payable commencing at age 55, or may be deferred until later at the employee's option.

c. Refund of Contributions:

In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.

9. Accidental Disability

a. Eligibility:

Participants are eligible for an accidental disability benefit, regardless of service or age, if they become permanently and totally incapacitated for further duty as a result of personal injury sustained while in the performance of duties.

b. Benefit Amount:

The accidental disability amount is 72% of annual salary plus $450 per year for each child plus an additional annuity based upon accumulated Member Contributions with credited interest.

10. Ordinary Disability

a. Eligibility:

An ordinary disability occurs when a member becomes permanently and totally disabled due to sickness or injury that is not job related. In order to be eligible for an ordinary disability benefit, a member must have ten years of service (and be less than age 55).

b. Benefit Amount:

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55. If the member was a veteran, the benefit is 50% of the member's final rate of Salary during the preceding 12 months, plus an annuity based upon accumulated Member Contributions plus credited interest. If the participant is over age 55, he will receive not less than the superannuation allowance to which he is entitled.

11. Survivor Benefits

a. Occupational Death:

The survivors of a member who dies due to an occupational injury will be entitled to a lump sum return of contributions plus a pension benefit equal to 72% of the participant's annual Salary.

b. Non-Occupational Death:

Upon the death of a member other than due to an occupational injury, the designated beneficiary will be entitled to a retirement benefit as if Option C had been elected with a minimum of $250 per month to the surviving spouse, plus $120 for the first child, plus $90 for each additional child. If no beneficiary is designated and if the employee worked two years, and is married at least one year, the spouse may elect benefits. If there is no designated beneficiary or surviving spouse, then member contributions are returned. If there are dependent children but no surviving spouse, they may elect minimum survivor benefits of $250 per month plus $120 for the first child and $90 for each additional child.

c. Refund of Contributions:

Upon the death of a member not entitled to survivor benefits, the beneficiary is entitled to a refund of all member contributions with interest.

12. Cost-of-Living Increases

In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a cost-of-living adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees, and beneficiaries who have been receiving benefits payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is $12,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the State and are not the liability of the Retirement System.

13. Postretirement Death Benefits

Any benefits following the death of a member after retirement are based upon the form of benefit the participant elected at the time of retirement. There are three available forms as follows:

(i) Option A – Life annuity

(ii) Option B – Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member

(iii) Option C – Life annuity with 66-2/3% of benefit continued after death of member to designated joint annuitant

EXHIBIT 6 – ACTUARIAL METHODS AND ASSUMPTIONS:

The actuarial cost method, factors, and assumptions used in determining cost estimates are presented below.

1. **Member Data**

   The member data used in the determination of cost estimates consist of pertinent information with respect to the active, inactive, retired, and disabled members of the employer as supplied by the employer to the actuary.

2. **Valuation Date**

   January 1, 2012.

3. **Actuarial Cost Method**

   The costs of the Plan have been determined in accordance with the individual entry age normal actuarial cost method.

4. **Rate of Investment Return**

   It is assumed that the assets of the fund will accumulate at a compound annual rate of 8.00% per annum. The assumption was 8% for the previous actuarial valuation.

5. **Salary Scale**

   It is assumed that salaries including longevity will increase at a rate of 3.5% per year.

6. **Cost-of-Living Increases**

   Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and $12,000 per year.

7. **Value of Investments**

   Assets held by the fund are valued at market value as reported by the Public Employees'

Retirement Administration Commission (PERAC). The actuarial value of assets is determined using a five-year smoothing of unrealized gains and losses.

8. Annual Rate of Withdrawal Prior to Retirement

Based on an analysis of experience, the assumed annual rates of withdrawal may best be illustrated by the following rates at the following ages:

Service	General Employees	Police and Fire Employees
0	0.1500	0.0150
10	0.0540	0.0150
20	0.0200	0.0000
30	0.0000	0.0000

9. Annual Rate of Mortality

It is assumed that both pre-retirement and post retirement mortality are represented by the RP-2000 Mortality Table for males and females, adjusted with Scale AA for 15 years. Mortality for disabled members is represented by the RP-2000 Mortality Table set forward two years for all disabled members. For the previous actuarial valuation, there was no Scale AA adjustment for non-disabled members.

10. Service Retirement

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages:

Age	Male General Employees	Female General Employees	Male and Female Police and Fire Employees
50	0.0100	0.0150	0.02000
51	0.0100	0.0150	0.02000
52	0.0100	0.0200	0.02000
53	0.0100	0.0250	0.05000
54	0.0200	0.0250	0.07500
55	0.0200	0.0550	0.15000
56	0.0250	0.0650	0.10000
57	0.0250	0.0650	0.10000
58	0.0500	0.0650	0.10000
59	0.0650	0.0650	0.15000
60	0.1200	0.0500	0.20000
61	0.2000	0.1300	0.20000
62	0.3000	0.1500	0.25000
63	0.2500	0.1250	0.25000
64	0.2200	0.1800	0.30000
65	0.4000	0.1500	1.00000
66	0.2500	0.2000	1.00000
67	0.2500	0.2000	1.00000
68	0.3000	0.2500	1.00000
69	0.3000	0.2000	1.00000
70	1.0000	1.0000	1.00000

11. Annual Rate of Disability Prior to Retirement

Based on an analysis of experience, the assumed annual rates of disability may best be illustrated by the following probabilities at the following ages:

Attained Age	General Employees	Police and Fire Employees
20	0.0001	0.0010
30	0.0003	0.0030
40	0.0010	0.0030
50	0.0019	0.0125

In addition, it is assumed for the general employees that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).

12. Family Composition

It is assumed that 80% of all members will be survived by a spouse and that females (males) are three years younger (older) than members.

13. Administrative Expenses

The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for fiscal year 2012 is $120,000 and is anticipated to increase at 4.0% per year.

EXHIBIT 7 – GLOSSARY OF TERMS:

This glossary summarizes the technical terms contained in this report.

1. Actuarial Accrued Liability

That portion of the Actuarial Present Value of plan benefits that is not provided for by future employer Normal Costs or employee contributions.

2. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting the Retirement System such as:

- Rates of investment returns
- Increases in a member's salary
- Inflation
- The probability of mortality, turnover, disablement
- Retirement at each age and other relevant items

3. Actuarial Cost Method

A procedure for allocating the Actuarial Present Value of pension plan benefits between Normal Cost and Actuarial Accrued Liability.

4. Actuarial Present Value

The single sum amount required at the valuation date that is required to provide for anticipated future events based upon the terms of the plan and the Actuarial Assumptions.

5. Forecast

A projection of future benefit payments or contribution requirements based upon the terms of the plan, the current asset amounts, the Actuarial Assumptions, and additional assumptions as to the replacement of terminating employees with new employees.

6. <u>Normal Cost</u>

That portion of the Actuarial Present Value of future benefits that is assigned to the current year.

7. <u>Unfunded Actuarial Accrued Liability</u>

That portion of the Actuarial Accrued Liability that is not provided for by current actuarial value of assets.

8. <u>Valuation Method</u>

The method used to divide the cost of future benefits among the Actuarial Accrued Liability, the current year's Normal Costs, and future years' Normal Costs. The resulting current funding requirement is then determined as the current year's Normal Cost plus the payment necessary to amortize the Unfunded Actuarial Liability.

9. <u>Vested Liability</u>

That portion of the Actuarial Present Value of Accrued Benefits that a member would be entitled to if the member terminated employment with the employer as of the valuation date.

CERTIFICATION:

This report fairly represents the actuarial position of the Town of Shrewsbury Retirement System contributing as of January 1, 2012, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost is reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience.

Sherman Actuarial Services, LLC

Daniel W. Sherman, ASA, MAAA
Enrolled Actuary No. 11-4086

January, 2013

BREAKOUTS

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Breakouts

	Total	All Others	Housing	Light	Cable	Water	Sewer	Custodians	School Employees
(1) Participants									
(a) Actives	582	158	10	37	32	12	4	20	309
(b) Inactives	106	17	1	4	11	4	0	6	63
(c) Retirees and Benefiaries	209	111	2	24	3	9	1	20	39
(d) Disabled Retirees	28	20	0	2	0	1	0	3	2
(e) Total	925	306	13	67	46	26	5	49	413
(2) Payroll of Active Participants	$22,671,647	$8,566,767	$501,307	$2,423,949	$1,878,215	$612,107	$181,370	$913,944	$7,593,988
(3) Normal Cost									
(a) Total Normal Cost	2,668,420	1,168,122	34,639	338,638	180,791	55,005	16,344	97,996	776,885
(b) Expected Employee Contributions	1,900,439	822,138	36,283	164,518	141,519	53,320	10,733	83,973	587,955
(c) Administrative Expenses	120,000	52,531	1,558	15,229	8,130	2,474	735	4,407	34,937
(d) Net Employer Normal Cost (a) - (b) + (c)	887,981	398,515	(86)	189,349	47,402	4,159	6,346	18,430	223,867
(4) Actuarial Accrued Liability	105,086,411	58,487,368	1,853,105	16,971,939	4,011,385	3,294,185	589,558	6,323,882	13,554,990
(5) Assets*	71,863,914	39,168,260	1,214,832	13,105,077	2,797,793	2,159,554	386,494	4,145,719	8,886,184
(6) Unfunded Actuarial Accrued Liability (4) - (5)	33,222,497	19,319,108	638,273	3,866,862	1,213,592	1,134,631	203,064	2,178,163	4,668,806
(7) Amortizations*	3,835,953	2,230,633	73,697	446,478	140,124	131,007	23,446	251,496	539,072
(8) Total Required Employer Contributions (3d) + (7)	4,723,934	2,629,148	73,610	635,826	187,527	135,166	29,792	269,926	762,939
(9) Fiscal 2014 Cost	5,270,842	2,933,535	82,133	709,438	209,237	150,815	33,241	301,176	851,267
(10) Fiscal 2015 Cost	5,490,809	3,055,959	85,561	739,045	217,969	157,109	34,628	313,745	886,793
(11) Fiscal 2016 Cost	5,713,582	3,179,947	89,032	769,029	226,812	163,483	36,033	326,474	922,772
(12) Percentage of Total Cost	100.0%	55.7%	1.6%	13.5%	4.0%	2.9%	0.6%	5.7%	16.2%
(13) Funded Ratio	68.39%	66.97%	65.56%	77.22%	69.75%	65.56%	65.56%	65.56%	65.56%

* Allocation is based on the ratio of the Unfunded Actuarial Accrued Liability, adjusted for additional contributions.