

City of Brockton Contributory Retirement System

Actuarial Valuation Report

Plan Year as of January 1, 2015

August 2016



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Section I - Overview

The City of Brockton Retirement Board has engaged Buck Consultants to prepare an actuarial valuation of the Retirement System as of January 1, 2015. Employee data and asset information used in the valuation were provided by the Retirement Board. This valuation is based upon census data as of January 1, 2014, rolled forward to January 1, 2015, under the actuarial assumptions set forth in Schedule A of this report and asset information as of December 31, 2014. This report is a revision of the original report dated October 6, 2015 to reflect a change in the roll-forward methodology used to determine GASB liabilities.

The valuation was prepared pursuant to Chapter 32 of the Massachusetts General Laws, based upon the acceptance of Section 22D.

The purposes of the valuation are to:

- 1) analyze the current funded position of the System and determine the level of contributions necessary to assure sound funding;
- 2) update the Section 22D funding schedule currently in place for the Retirement System; and
- 3) provide reporting and disclosure information for financial statements, governmental agencies and other interested parties.

Schedule A of this report outlines the actuarial assumptions and methods used in the valuation. All assumptions are the same as those used in the previous valuation, with the exception of the revision in the mortality assumption. The mortality rates applicable to non-disabled participants used for the prior year were based on RP-2000 Mortality Table with projections specified by IRS Regulation 1.430(h)(3)-1, as applicable to the valuation year using a combined static table for both annuitants and non-annuitants. The mortality assumption applicable to non-disabled participants was changed to the RP-2000 Mortality Table projected generationally with Scale BB for males and females. The revision in the mortality assumption increased the Accrued Liability by approximately \$17.5 million and increased the projected 2017 appropriation amount by approximately \$2 million. The economic assumptions are based upon a review of the current portfolio structure and economic environment and represent expectations with respect to future experience.

Section II provides a summary of the principal valuation results. Section V provides a projection of the Section 22D funding amounts.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions, applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

This report fairly represents the actuarial position of the City of Brockton Retirement System as of January 1, 2015, 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 are reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience. The valuation was performed by, and

Section I – Overview (continued)

under the supervision of, actuaries who have experience in performing valuations for public retirement systems. We are both Members of the American Academy of Actuaries and meet the Academy's Qualification Standards to issue this Statement of Actuarial Opinion and are available to answer any questions regarding the results.

Respectfully Submitted,

BUCK CONSULTANTS, LLC

David L. Driscoll, FSA, MAAA, EA
Principal, Retirement

Date

Hilja Viidemann, FSA, MAAA, EA
Senior Consultant, Retirement

Date

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Section II - Summary Of Principal Results

1. For convenience of reference, the principal results of the valuation as of January 1, 2015 are summarized below along with a comparison with the amounts in the previous valuation as of January 1, 2014.

Valuation Date	January 1, 2014	January 1, 2015 ¹
a) Active Members:		
Number	1,730	1,730
Annual compensation	\$ 73,756,821	\$ 73,756,821
Average age	46.5	46.5
Average service	11.6	11.6
Average compensation	\$ 42,634	\$ 42,634
b) Pensioners and beneficiaries:		
Number	1,261	1,261
Annual benefit payments	\$ 36,565,555	\$ 36,565,555
Average benefit	\$ 28,997	\$ 28,997
c) Inactive employees:		
Number	394	394
Accumulated employee contributions	\$ 2,078,515	\$ 2,078,515
d) Actuarial accrued liability	\$ 529,526,217	\$ 554,569,401
e) Market value of assets	\$ 363,463,353	\$ 371,991,381
f) Assets for valuation purposes	\$ 355,691,316	\$ 373,185,143
g) Unfunded actuarial accrued liability (d. – f.)	\$ 173,834,901	\$ 181,384,258
h) Funded percentage (f. / d.)	67.17%	67.29%
i) Section 22D funding for fiscal 2016	\$ 19,289,967	\$ 19,289,967
j) Section 22D funding for fiscal 2017	\$ 19,289,967	\$ 21,207,788

A projection of Section 22D costs is presented in Section V. Schedule A of this report outlines the actuarial assumptions and methods employed. The provisions of the System are summarized in Schedule B. The valuation includes additional liabilities resulting from Chapter 17 COLA legislation.

¹ Census information is as of January 1, 2014 and projected to the valuation date using the plan's demographic assumptions assuming no gains or losses.

Section III - Membership Data

In order to calculate the aggregate liabilities and assets on account of members of the System as of January 1, 2015, data was needed with respect to each active and retired member and beneficiary of the System. The data with respect to active, retired and terminated members and beneficiaries were furnished to the actuary by the Retirement Board. Census information is as of January 1, 2014 and projected to the valuation date using the plan's demographic assumptions assuming no gains or losses.

From the data, tabulations were made showing, as of January 1, 2014, the number and annual compensation of active members classified by age and years of service and the number and annual retirement allowances of retired members and beneficiaries as of January 1, 2014, classified by age. These tables are presented in Schedule C.

The following tables show the number of active and retired members of the Retirement System as of January 1, 2014.

Table I - The Number and Annual Compensation of Active Members as of January 1, 2014

Group	Number	Compensation
General employees	1,386	\$ 44,827,274
Police and Fire	344	\$ 28,929,547
Total	1,730	\$ 73,756,821

Table II - The Number and Annual Retirement Allowances of Retired Members and Beneficiaries as of January 1, 2014

Annual Retirement Allowance		
Group	Number	Pension ²
Service Retirements	874	\$ 25,228,764
Disability Retirements	186	\$ 7,901,568
Beneficiaries of Deceased Members	201	\$ 3,435,223
Grand Total	1,261	\$ 36,565,555

In addition, there are 394 members with estimated deferred benefits valued at \$2,078,515.

² Pension amounts exclude cost-of-living adjustments applied after July 1, 1981, and prior to July 1, 1998, which are funded by the Commonwealth of Massachusetts.

Section IV - Assets

The amount of assets taken into account in this valuation is based on financial information reported by the Retirement Board. As of January 1, 2015, the reported market value of Retirement System assets amounted to \$371,991,381. The actuarial value of assets for valuation funding purposes is \$373,185,1433. Valuation assets are developed using a smoothing method (described in Schedule A of this report) in order to smooth the year-to-year fluctuations due to deviations of investment returns from expected levels.

1. Market value of plan assets, January 1, 2014		\$ 363,463,353
2. Employer and employee contributions, net transfers and reimbursements	28,661,874	
3. Expenses	(677,927)	
4. Benefits and refunds	(39,205,353)	
5. Expected interest during the year	28,628,212	
6. Expected market value of plan assets, January 1, 2015		\$ 380,870,159
7. Actual market value of plan assets, January 1, 2015		371,991,381
8. Investment gain/(loss) during 2014 [7. – 6.]	(8,878,778)	
9. Investment gain/(loss) during 2013	11,975,626	
10. Investment gain/(loss) during 2012	10,770,348	
11. Investment gain/(loss) during 2011	(27,921,277)	
12. Tentative Valuation Assets before reflecting 80% - 120% corridor = [7. – 80% x 8. – 60% x 9. – 40% x 10. – 20% x 11.]		\$ 373,185,143
13. 80% of actual market value = 80% x 7.		297,593,105
14. 120% of actual market value = 120% x 7.		446,389,657
15. Valuation Assets = 12. But not less the 13. or greater than 14.		\$ 373,185,143

Section V - Contributions Payable Under the System

Section 22D of MGL Chapter 32 outlines various requirements of a funding schedule that will amortize the unfunded actuarial liability and cover normal costs. The normal cost and unfunded actuarial liability are to be calculated in accordance with the individual entry-age-normal actuarial cost method. The contribution toward amortization of the unfunded actuarial liability may increase by up to 4½% each year.

The following table presents a projection of contributions that satisfy the Section 22D requirements. The normal cost is assumed to increase by 4% annually while the unfunded accrued liability contribution is based on a 4½% annual increase and is assumed to be paid mid-year. This schedule incorporates the funding required to provide annual COLAs under Chapter 17 of the Acts of 1997.

Please note that the amounts shown in the following schedule for the 2016 fiscal year represent the actual amounts already appropriated by the City for the 2016 fiscal year.

Section V - Contributions Payable Under the System (continued)

Pension Reform Act - Section 22D Funding Requirements

Fiscal Year Ending In	Normal Cost	Amortization of the Unfunded Actuarial Liability			Total City Contribution
		UAL	1992 ERI	Total Payment	
2016	5,434,220	13,783,311	72,436	13,855,747	19,289,967
2017	6,020,998	15,114,354	72,436	15,186,790	21,207,788
2018	6,204,450	15,794,500	72,436	15,866,936	22,071,386
2019	6,392,943	16,505,252	72,436	16,577,688	22,970,631
2020	6,586,589	17,247,989	0	17,247,989	23,834,578
2021	6,785,497	18,024,149	0	18,024,149	24,809,646
2022	6,989,781	18,835,235	0	18,835,235	25,825,016
2023	7,199,550	19,682,821	0	19,682,821	26,882,371
2024	7,414,916	20,568,548	0	20,568,548	27,983,464
2025	7,635,992	21,494,132	0	21,494,132	29,130,124
2026	7,862,891	22,461,368	0	22,461,368	30,324,259
2027	8,095,725	23,472,130	0	23,472,130	31,567,855
2028	8,334,605	24,528,375	0	24,528,375	32,862,980
2029	8,579,641	25,632,153	0	25,632,153	34,211,794
2030	8,830,945	26,785,599	0	26,785,599	35,616,544
2031	9,088,626	27,990,951	0	27,990,951	37,079,577
2032	9,352,792	20,716,128	0	20,716,128	30,068,920
2033	9,623,549	0	0	0	9,623,549
2034	9,901,003	0	0	0	9,901,003
2035	10,185,256	0	0	0	10,185,256
2036	10,476,406	0	0	0	10,476,406
2037	10,774,552	0	0	0	10,774,552
2038	11,079,788	0	0	0	11,079,788
2039	11,392,203	0	0	0	11,392,203
2040	11,711,884	0	0	0	11,711,884
2041	12,038,912	0	0	0	12,038,912
2042	12,373,363	0	0	0	12,373,363
2043	12,868,297	0	0	0	12,868,297
2044	13,383,029	0	0	0	13,383,029
2045	13,918,350	0	0	0	13,918,350
2046	14,475,084	0	0	0	14,475,084

Section VI – Accounting Information

Information required under Statement No. 67 of the Governmental Accounting Standard Board (GASB) is shown below:

A. Summary of Significant Accounting Policies

Method used to value investments.

Investments are reported at fair value.

B. Plan Description

Plan administration

The City of Brockton, Massachusetts administers the Contributory Retirement System (Plan), a defined benefit pension plan that covers all employees of participating units except teachers, elected officials and those employees in service at the time of its establishment who elected not to become members. Eligible employees in the City who enter service on or after the date the System became operative for their classification may become members of the Retirement System on their own application.

Plan membership

Plan membership is summarized in Section III.

Benefits provided

Please see Schedule B of the report for a summary of plan provisions.

Contributions

The City establishes contributions based on an actuarially determined contribution recommended by an independent actuary. The actuarially determined contribution is developed using the Entry Age Normal Actuarial Cost Method. For the sponsor fiscal year ended June 30, 2015, the City contributed \$19,332,315 to the plan.

C. Investments

Rate of return

For the year ended June 30, 2015, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 4.38%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

D. Receivables

No receivable contributions have been included in plan assets.

Section VI – Accounting Information (continued)

E. Net Pension Liability

The components of the net pension liability at December 31, 2014, were as follows:

Components of Net Pension Liability	
Total pension liability	\$ 561,501,885
Plan fiduciary net position	(371,991,381)
City's net pension liability	\$ 189,510,504
Plan fiduciary net position as a percentage of the total pension liability	66.25%

F. Actuarial assumptions

The total pension liability was determined by an actuarial valuation as of June 30, 2015, using the following actuarial assumptions, applied to all periods included in the measurement. The assumptions used to develop the figures presented for GASB 67 and 68 are the same as those set forth in Schedule A of the report except where noted:

Actuarial Assumptions	
Inflation	3.00%
Salary Increases	See page 21
Investment rate of return	8.00%, net of pension plan investment expenses. This is based on an average inflation rate of 3.00% and a real rate of return of 5.00%.

The mortality assumption applicable to non-disabled participants was changed to the RP-2000 Mortality Table projected generationally with Scale BB for males and females.

The long-term expected rate of return on Fund investments was determined using best-estimate ranges of expected future nominal rates of return (expected returns, net of investment expense and inflation) developed for each major asset class using an econometric model that forecasts a variety of economic environments and then calculates asset class returns based on functional relationships between the economic variables and the asset classes. Best estimates of arithmetic rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2014 are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return
Equity	8.46%
Fixed income	1.83%
Alternatives	7.92%

Nominal long-term expected rates of return for these asset classes are equal to the sum of the above expected long-term real rates and the expected long-term inflation rate of 3.00%.

Section VI – Accounting Information (continued)

Discount rate

The discount rate used to measure the total pension liability was 8.00%. The projection of cash flows used to determine the discount rate assumed that contributions will continue to follow the pattern of contributions observed over the last five years. During that period, the City contributed 100% of the cumulative recommended contribution level. Accordingly, the fiduciary net position was projected assuming that 100% of future recommended contribution levels will be contributed. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Had the fiduciary net position been projected to be depleted, a municipal bond rate of 3.73% would have been used in the development of the blended GASB discount rate after that point. The 3.73% rate is based on the S&P Municipal Bond 20 Year High Grade Rate Index.

Sensitivity of the net pension liability to changes in the discount rate

The following presents the net pension liability, calculated using the discount rate of 8.00%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (7.00%) or 1-percentage-point higher (9.00%) than the current rate:

	1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
Net Pension Liability	\$247,412,055	\$ 189,510,504	\$140,133,096

Section VI – Accounting Information (continued)

Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios

	2015
Total pension liability	
Service cost	\$ 10,817,393
Interest	41,739,197
Changes of benefit terms	0
Differences between expected and actual experience	0
Changes of assumptions	17,356,197
Benefit payments	<u>(37,937,119)</u>
Net change in total pension liability	\$ 31,975,668
Total pension liability-beginning	\$ 529,526,217
Total pension liability-ending (a)	\$ 561,501,885
Plan fiduciary net pension	
Contributions-employer	\$ 19,332,315
Contributions-employee	8,467,701
Net investment income	15,837,436
Benefit payments, including refunds of employee contributions	(37,937,119)
Administrative expense	(677,927)
Other	<u>(406,376)</u>
Net change in plan fiduciary net position	\$ 4,616,030
Plan fiduciary net position-beginning	\$ 367,375,351 ¹
Plan fiduciary net position-ending (b)	\$ 371,991,381
Net pension liability-ending (a)-(b)	\$ 189,510,504
Covered payroll	\$ 76,707,094
Net pension liability as a percentage of payroll	247.06%

Notes to Schedule:

A. Benefit changes

None.

B. Changes of assumptions

The mortality rates applicable to non-disabled participants used for the prior year were based on RP-2000 Mortality Table with projections specified by IRS Regulation 1.430(h)(3)-1, as applicable to the valuation year using a combined static table for both annuitants and non-annuitants. The mortality assumption applicable to non-disabled participants was changed to the RP-2000 Mortality Table projected generationally with Scale BB for males and females.

¹ The beginning asset value differs from the asset value in the 1/1/2014 report because the 1/1/2014 report used preliminary asset values.

Section VI – Accounting Information (continued)

Schedules of Required Supplementary Information (continued)

Schedule of Contributions

	2015
Actuarially determined contribution	\$19,289,967
Contributions related to the actuarially determined contribution	(19,332,315)
Contribution deficiency (excess)	\$ (42,348)

Notes to Schedule:

A. Valuation date

Actuarially determined contribution rates are calculated as of January 1, in the fiscal year preceding the fiscal year in which contributions are made. That is, the contribution calculated as of January 1, 2015 will be made during the fiscal year ended June 30, 2016.

B. Methods and assumptions used to determine contribution rates:

Please see Section 7 of the report.

Schedule of Investment Returns

	2014
Annual money-weighted rate of return, net of investment expenses	4.38%

Section VI – Accounting Information (continued)

Table 1 - Projection of Fiduciary Net Position (000's omitted)

Fiscal Year Ending 6/30	Beginning Fiduciary Net Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Investment Earnings	Ending Fiduciary Net Position
2016	\$ 371,991	\$ 6,270	\$ 20,138	\$ 40,123	\$ 707	\$ 29,182	\$ 386,751
2017	\$ 386,751	6,151	20,756	41,101	687	30,345	402,216
2018	\$ 402,216	6,025	20,947	42,177	670	31,542	417,884
2019	\$ 417,884	5,874	21,346	43,406	652	32,757	433,802
2020	\$ 433,802	5,713	21,942	44,651	631	33,999	450,174
2021	\$ 450,174	5,536	22,504	45,906	610	35,275	466,974
2022	\$ 466,974	5,360	23,109	47,192	587	36,585	484,248
2023	\$ 484,248	5,182	23,751	48,448	565	37,937	502,105
2024	\$ 502,105	5,000	24,455	49,716	544	39,336	520,636
2025	\$ 520,636	4,789	25,176	51,138	521	40,783	539,725
2026	\$ 539,725	4,575	25,974	52,519	500	42,279	559,534
2027	\$ 559,534	4,344	26,824	53,989	500	43,830	580,043
2028	\$ 580,043	4,118	27,734	55,366	500	45,443	601,472
2029	\$ 601,472	3,881	28,695	56,740	500	47,131	623,939
2030	\$ 623,939	3,658	29,711	57,966	500	48,911	647,753
2031	\$ 647,753	3,426	30,758	59,174	500	50,801	673,063
2032	\$ 673,063	3,185	23,133	60,354	500	52,464	690,991
2033	\$ 690,991	2,944	1,507	61,425	500	52,980	686,498
2034	\$ 686,498	2,711	1,342	62,311	500	52,570	680,309
2035	\$ 680,309	2,477	1,168	63,074	500	52,028	672,407
2036	\$ 672,407	2,218	993	63,938	500	51,343	662,523
2037	\$ 662,523	1,990	856	64,451	500	50,518	650,937
2038	\$ 650,937	1,772	733	64,776	500	49,564	637,730
2039	\$ 637,730	1,571	626	64,860	500	48,492	623,058
2040	\$ 623,058	1,391	541	64,694	500	47,314	607,111
2041	\$ 607,111	1,221	469	64,360	500	46,042	589,982
2042	\$ 589,982	1,060	410	63,856	500	44,683	571,779
2043	\$ 571,779	919	349	63,125	500	43,248	552,670
2044	\$ 552,670	788	307	62,224	500	41,748	532,789

Section VI – Accounting Information (continued)

Table 1 - Projection of Fiduciary Net Position (000's omitted) (continued)

Fiscal Year Ending 6/30	Beginning Fiduciary Net Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Investment Earnings	Ending Fiduciary Net Position
2045	\$ 532,789	648	302	61,193	500	40,193	512,239
2046	\$ 512,239	538	297	59,912	500	38,596	491,257
2047	\$ 491,257	455	276	58,533	500	36,968	469,923
2048	\$ 469,923	387	264	56,996	500	35,320	448,398
2049	\$ 448,398	332	263	55,332	500	33,662	426,823
2050	\$ 426,823	269	261	53,703	500	31,999	405,149
2051	\$ 405,149	222	259	51,925	500	30,334	383,539
2052	\$ 383,539	180	262	50,095	500	28,677	362,062
2053	\$ 362,062	141	268	48,229	500	27,032	340,774
2054	\$ 340,774	110	276	46,293	500	25,406	319,773
2055	\$ 319,773	81	283	44,334	500	23,803	299,106
2056	\$ 299,106	60	291	42,316	500	22,230	278,871
2057	\$ 278,871	45	300	40,261	500	20,693	259,148
2058	\$ 259,148	31	309	38,199	500	19,198	239,987
2059	\$ 239,987	22	318	36,121	500	17,748	221,454
2060	\$ 221,454	15	326	34,043	500	16,348	203,600
2061	\$ 203,600	9	334	31,979	500	15,003	186,467
2062	\$ 186,467	5	342	29,929	500	13,714	170,100
2063	\$ 170,100	2	350	27,899	500	12,486	154,539
2064	\$ 154,539	1	358	25,902	500	11,321	139,816
2065	\$ 139,816	0	365	23,943	500	10,222	125,962
2066	\$ 125,962	-	374	22,036	500	9,190	112,990
2067	\$ 112,990	-	381	20,187	500	8,227	100,912
2068	\$ 100,912	-	389	18,406	500	7,332	89,727
2069	\$ 89,727	-	397	16,703	500	6,506	79,427
2070	\$ 79,427	-	405	15,086	500	5,747	69,992
2071	\$ 69,992	-	412	13,561	500	5,053	61,397
2072	\$ 61,397	-	420	12,132	500	4,423	53,608
2073	\$ 53,608	-	427	10,804	500	3,854	46,585

Section VI – Accounting Information (continued)

Table 1 - Projection of Fiduciary Net Position (000's omitted) (continued)

Fiscal Year Ending 6/30	Beginning Fiduciary Net Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Investment Earnings	Ending Fiduciary Net Position
2074	\$ 46,585	-	434	9,578	500	3,341	40,281
2075	\$ 40,281	-	440	8,452	500	2,882	34,651
2076	\$ 34,651	-	446	7,425	500	2,473	29,646
2077	\$ 29,646	-	452	6,491	500	2,110	25,217
2078	\$ 25,217	-	457	5,647	500	1,790	21,317
2079	\$ 21,317	-	462	4,887	500	1,508	17,900
2080	\$ 17,900	-	466	4,204	500	1,262	14,924
2081	\$ 14,924	-	470	3,595	500	1,049	12,348
2082	\$ 12,348	-	474	3,053	500	865	10,134
2083	\$ 10,134	-	477	2,573	500	707	8,245
2084	\$ 8,245	-	480	2,150	500	573	6,647
2085	\$ 6,647	-	483	1,781	500	460	5,309
2086	\$ 5,309	-	485	1,461	500	366	4,198
2087	\$ 4,198	-	487	1,186	500	288	3,286
2088	\$ 3,286	-	489	953	500	224	2,547
2089	\$ 2,547	-	491	757	500	173	1,953
2090	\$ 1,953	-	492	595	500	132	1,482
2091	\$ 1,482	-	493	463	500	100	1,113
2092	\$ 1,113	-	494	355	500	75	826
2093	\$ 826	-	495	270	500	55	607
2094	\$ 607	-	496	202	500	40	441
2095	\$ 441	-	496	149	500	29	318
2096	\$ 318	-	497	108	500	21	228
2097	\$ 228	-	497	77	500	15	163
2098	\$ 163	-	498	55	500	11	116
2099	\$ 116	-	498	38	500	8	84
2100	\$ 84	-	498	26	500	6	62
2101	\$ 62	-	498	17	500	4	47
2102	\$ 47	-	498	11	500	3	37

Section VI – Accounting Information (continued)

Table 1 - Projection of Fiduciary Net Position (000's omitted) (continued)

Fiscal Year Ending 6/30	Beginning Fiduciary Net Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Investment Earnings	Ending Fiduciary Net Position
2103	\$ 37	-	498	7	500	3	31
2104	\$ 31	-	498	5	500	2	27
2105	\$ 27	-	498	3	500	2	24
2106	\$ 24	-	498	2	500	2	23
2107	\$ 23	-	498	1	500	2	22
2108	\$ 22	-	498	1	500	2	21
2109	\$ 21	-	498	0	500	2	21
2110	\$ 21	-	498	0	500	2	21
2111	\$ 21	-	498	0	500	2	21
2112	\$ 21	-	498	0	500	2	20
2113	\$ 20	-	498	0	500	2	20
2114	\$ 20	-	498	0	500	-	19

Section VI – Accounting Information (continued)

Table 2 - Actuarial Present Values of Projected Benefit Payments (000's omitted)

Fiscal Year Ending 6/30	Beginning Fiduciary Net Position	Benefit Payments	Benefit Payments		Present Value of Benefit Payments		
			Funded Portion	Unfunded Portion	Funded Portion at 8.00%	Unfunded Portion at 3.73%	Using a Single Discount Rate of 8.00%
2016	\$ 371,991	\$ 40,123	\$ 40,123	\$ -	\$ 38,608	\$ -	\$ 38,608
2017	386,751	41,101	41,101	-	36,620	-	36,620
2018	402,216	42,177	42,177	-	34,795	-	34,795
2019	417,884	43,406	43,406	-	33,156	-	33,156
2020	433,802	44,651	44,651	-	31,581	-	31,581
2021	450,174	45,906	45,906	-	30,063	-	30,063
2022	466,974	47,192	47,192	-	28,616	-	28,616
2023	484,248	48,448	48,448	-	27,202	-	27,202
2024	502,105	49,716	49,716	-	25,846	-	25,846
2025	520,636	51,138	51,138	-	24,616	-	24,616
2026	539,725	52,519	52,519	-	23,408	-	23,408
2027	559,534	53,989	53,989	-	22,281	-	22,281
2028	580,043	55,366	55,366	-	21,157	-	21,157
2029	601,472	56,740	56,740	-	20,076	-	20,076
2030	623,939	57,966	57,966	-	18,990	-	18,990
2031	647,753	59,174	59,174	-	17,950	-	17,950
2032	673,063	60,354	60,354	-	16,952	-	16,952
2033	690,991	61,425	61,425	-	15,975	-	15,975
2034	686,498	62,311	62,311	-	15,005	-	15,005
2035	680,309	63,074	63,074	-	14,063	-	14,063
2036	672,407	63,938	63,938	-	13,200	-	13,200
2037	662,523	64,451	64,451	-	12,320	-	12,320
2038	650,937	64,776	64,776	-	11,465	-	11,465
2039	637,730	64,860	64,860	-	10,630	-	10,630
2040	623,058	64,694	64,694	-	9,817	-	9,817
2041	607,111	64,360	64,360	-	9,043	-	9,043
2042	589,982	63,856	63,856	-	8,308	-	8,308

Section VI – Accounting Information (continued)

Table 2 - Actuarial Present Values of Projected Benefit Payments (000's omitted) (continued)

Fiscal Year Ending 6/30	Beginning Fiduciary Net Position	Benefit Payments	Benefit Payments		Present Value of Benefit Payments		
			Funded Portion	Unfunded Portion	Funded Portion at 8.00%	Unfunded Portion at 3.73%	Using a Single Discount Rate of 8.00%
2043	571,779	63,125	63,125	-	7,604	-	7,604
2044	552,670	62,224	62,224	-	6,940	-	6,940
2045	532,789	61,193	61,193	-	6,320	-	6,320
2046	512,239	59,912	59,912	-	5,729	-	5,729
2047	491,257	58,533	58,533	-	5,183	-	5,183
2048	469,923	56,996	56,996	-	4,673	-	4,673
2049	448,398	55,332	55,332	-	4,200	-	4,200
2050	426,823	53,703	53,703	-	3,775	-	3,775
2051	405,149	51,925	51,925	-	3,379	-	3,379
2052	383,539	50,095	50,095	-	3,019	-	3,019
2053	362,062	48,229	48,229	-	2,691	-	2,691
2054	340,774	46,293	46,293	-	2,392	-	2,392
2055	319,773	44,334	44,334	-	2,121	-	2,121
2056	299,106	42,316	42,316	-	1,874	-	1,874
2057	278,871	40,261	40,261	-	1,651	-	1,651
2058	259,148	38,199	38,199	-	1,451	-	1,451
2059	239,987	36,121	36,121	-	1,270	-	1,270
2060	221,454	34,043	34,043	-	1,108	-	1,108
2061	203,600	31,979	31,979	-	964	-	964
2062	186,467	29,929	29,929	-	835	-	835
2063	170,100	27,899	27,899	-	721	-	721
2064	154,539	25,902	25,902	-	620	-	620
2065	139,816	23,943	23,943	-	531	-	531
2066	125,962	22,036	22,036	-	452	-	452
2067	112,990	20,187	20,187	-	383	-	383
2068	100,912	18,406	18,406	-	324	-	324
2069	89,727	16,703	16,703	-	272	-	272

Section VI – Accounting Information (continued)

Table 2 - Actuarial Present Values of Projected Benefit Payments (000's omitted) (continued)

Fiscal Year Ending 6/30	Beginning Fiduciary Net Position	Benefit Payments	Benefit Payments		Present Value of Benefit Payments		
			Funded Portion	Unfunded Portion	Funded Portion at 8.00%	Unfunded Portion at 3.73%	Using a Single Discount Rate of 8.00%
2070	79,427	15,086	15,086	-	228	-	228
2071	69,992	13,561	13,561	-	189	-	189
2072	61,397	12,132	12,132	-	157	-	157
2073	53,608	10,804	10,804	-	129	-	129
2074	46,585	9,578	9,578	-	106	-	106
2075	40,281	8,452	8,452	-	87	-	87
2076	34,651	7,425	7,425	-	71	-	71
2077	29,646	6,491	6,491	-	57	-	57
2078	25,217	5,647	5,647	-	46	-	46
2079	21,317	4,887	4,887	-	37	-	37
2080	17,900	4,204	4,204	-	29	-	29
2081	14,924	3,595	3,595	-	23	-	23
2082	12,348	3,053	3,053	-	18	-	18
2083	10,134	2,573	2,573	-	14	-	14
2084	8,245	2,150	2,150	-	11	-	11
2085	6,647	1,781	1,781	-	8	-	8
2086	5,309	1,461	1,461	-	6	-	6
2087	4,198	1,186	1,186	-	5	-	5
2088	3,286	953	953	-	4	-	4
2089	2,547	757	757	-	3	-	3
2090	1,953	595	595	-	2	-	2
2091	1,482	463	463	-	1	-	1
2092	1,113	355	355	-	1	-	1
2093	826	270	270	-	1	-	1
2094	607	202	202	-	-	-	-
2095	441	149	149	-	-	-	-
2096	318	108	108	-	-	-	-
2097	228	77	77	-	-	-	-

Section VI – Accounting Information (continued)

Table 2 - Actuarial Present Values of Projected Benefit Payments (000's omitted) (continued)

Fiscal Year Ending 6/30	Beginning Fiduciary Net Position	Benefit Payments	Benefit Payments		Present Value of Benefit Payments		
			Funded Portion	Unfunded Portion	Funded Portion at 8.00%	Unfunded Portion at 3.73%	Using a Single Discount Rate of 8.00%
2098	163	55	55	-	-	-	-
2099	116	38	38	-	-	-	-
2100	84	26	26	-	-	-	-
2101	62	17	17	-	-	-	-
2102	47	11	11	-	-	-	-
2103	37	7	7	-	-	-	-
2104	31	5	5	-	-	-	-
2105	27	3	3	-	-	-	-
2106	24	2	2	-	-	-	-
2107	23	1	1	-	-	-	-
2108	22	1	1	-	-	-	-
2109	21	0	0	-	-	-	-
2110	21	0	0	-	-	-	-
2111	21	0	0	-	-	-	-
2112	21	0	0	-	-	-	-
2113	20	0	0	-	-	-	-
Total					<u>\$ 643,458</u>	<u>\$ -</u>	<u>\$ 643,458</u>

Schedule A - Actuarial Assumptions and Methods

Valuation Interest Rate

8.00% per annum, compounded annually, net of expenses.

Separations from Active Service

Representative values of the assumed annual rates of withdrawal and vesting, disability, death and service retirement are as follows:

General Employees-Annual Rates of

Age	Disability	Service Retirement	
		Male	Female
25	.02%		
30	.03		
35	.06		
40	.10		
45	.15		
50	.19	1.0%	1.5%
55	.24	2.0	5.5
60	.28	12.0	5.0
62	.30	30.0	15.0
65	.30	40.0	15.0
69		30.0	20.0

Years of Service	Salary Scale
0	6.00%
1	5.50
2	5.50
3	5.00
4	5.00
5	4.50
6	4.50
7	4.00
8	4.00
9+	3.75

Years of Service	Rates of Withdrawal
0	15.0%
1	12.0%
2	10.0%
3	9.0%
4	8.0%
5	7.6%
10	5.4%
15	3.3%
20	2.0%
25	1.0%
30+	0.0%

Police and Fire-Annual Rates of

Age	Disability	Service Retirements
25	0.20%	
30	0.30	
35	0.30	
40	0.30	
45	1.00	1.0%
50	1.25	2.0
55	1.20	15.0
60	0.85	20.0
62	0.75	25.0
65	0.00	100.0
69		

Years of Service	Salary Scale
0	7.00%
1	6.50
2	6.00
3	5.50
4	5.00
5	5.00
6	4.50
7	4.50
8+	4.25

Years of Service	Rates of Withdrawal
0	1.5%
1	1.5
2	1.5
3	1.5
4	1.5
5	1.5
6	1.5
7	1.5
8	1.5
9	1.5
10	1.5
11+	0.0

It is assumed that 80% of all deaths are ordinary (20% are service connected). In addition, it is assumed for the general employees that 40% of all disabilities are ordinary (60% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected). A load was applied to the accidental disability liability to account for the additional benefit payable for each dependent child upon the member's disability. Loads of approximately 2% and 11.7% were developed for Group 1 and Group 4, respectively, taking into account the higher likelihood of Group 4 accidental disabilities at younger ages, thus the likelihood of Group 4 having more dependent children than Group 1 accidental disability retirees.

Schedule A - Actuarial Assumptions and Methods (continued)

Cost-of-Living Adjustments

Retirement benefits were assumed to increase annually by 3%, up to a maximum of \$360.

Mortality

It is assumed that healthy mortality is represented by the RP-2000 Mortality Table projected generationally with Scale BB for males and females. Mortality for disabled members is represented by the RP-2000 Mortality Table set forward two years for all disabled members.

Form of Payment

Future retirees are assumed to elect a Life Annuity. Future vested terminations are assumed to elect a refund of contributions.

Marital Percentage

80% of participants are assumed to be married at death. Husbands are assumed to be 3 years older than their wives.

Loading or Contingency Reserve

None.

Actuarial Cost Method

Individual entry-age normal cost method.

Administrative Expenses

The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for plan year 2015 is \$707,200 and is anticipated to increase at 4.0% per year.

Asset Valuation Method

For funding calculation purposes, assets are valued according to the following general formula, provided such value is within a 20% corridor of the market value:

$$VA = MV - .8I_1 - .6I_2 - .4I_3 - .2I_4 \quad \text{where}$$

VA = Valuation assets.

MV = Market value of assets as of the valuation date.

I_n = Investment gain (loss) during n^{th} year preceding the valuation date.

GASB 67 and 68 Measurement Date

December 31, 2014.

Schedule B - Summary of System Provisions

Membership

The Retirement System covers all employees of participating units except teachers, elected officials and those employees in service at the time of its establishment who elected not to become members. Eligible employees in the City who enter service on or after the date the System became operative for their classification may become members of the Retirement System on their own application.

Summary of Benefit and Contribution Provisions

A summary of the main benefit and contribution provisions of the Retirement System, as interpreted for the valuation, is presented below.

The terms "Group 1" and "Group 4" are used to denote "general employees" and "police and fire", respectively.

Benefits

Final Average Salary (FAS)

For those hired prior to April 2, 2012, the average of a member's three highest consecutive years' compensation. For those hired on or after April 2, 2012, the average of a member's five highest consecutive years' compensation. For those hired on or after January 1, 2011, salary taken into account for benefit purposes is capped at 64% of the IRC Section 401(a)(17) limit (indexed).

Superannuation Retirement

Eligibility

For those hired prior to April 2, 2012: Age 65 for Group 1; Age 55 for Group 4. Maximum retirement age is 70 for Group 1 and 65 for Group 4.

For those hired on or after April 2, 2012: Age 67 for Group 1; Age 57 for Group 4 if member has completed 30 years of service, or age 62 otherwise.

Allowance

2.5% per year of service times FAS. Maximum total allowance is 80% of FAS. Veterans receive additional \$15 annually per year of service to a maximum of \$300 annually.

Early Retirement

Eligibility

20 years of service, or age 55 with 10 years of service. Group 1 members hired after April 1, 2012 are eligible upon the attainment of age 60 and 10 years of service.

Allowance

Calculated as a superannuation retirement allowance (including veteran's benefits) except accrual rate is equal to 2.5% reduced by .1% for each year age at retirement is below either 65 for Group 1 or 55 for Group 4. If hired after April 1, 2012, the accrual rate of 2.5% is reduced by .15% for each year age at retirement precedes age 67 for Group 1 or age 57 for Group 4 (age 62 if service at retirement is less than 30 years).

The minimum allowance after 30 years of service is equal to:

- (1) An annuity which is the actuarial equivalent of member's accumulated deductions; and
- (2) A pension equal to 1/3 of FAS and any veteran's benefits as described under superannuation retirement.

Schedule B - Summary of System Provisions (continued)

Vested Retirement

Eligibility

10 years of service. For certain involuntary terminations, this is reduced to 6 years.

Allowance

A superannuation retirement allowance commencing at age 55 for Group 1 members (age 60 if hired after April 1, 2012) and age 45 for Group 4 members (age 55 if hired after April 1, 2012) or later, where the accrual rate is determined by the age of the member at the time the allowance commences.

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.

Ordinary Disability

Eligibility

10 years of service

Allowance

An immediate allowance equal to the age 55 rate for Group 1 members or age 45 rate for Group 4 members per year of service times FAS.

Veterans receive an allowance equal to:

- (1) An annuity which is the actuarial equivalent of their accumulated deductions; and
- (2) A pension which is the greater of 50% of current salary and the service retirement allowance to which they are eligible, if any.

Accidental Disability

Eligibility

Permanent incapacity for further duty as a result of personal injury sustained while in the performance of duties.

Allowance

An immediate allowance equal to:

- (1) An annuity which is the actuarial equivalent of the member's accumulated deductions; and
- (2) A pension equal to 72% of current salary; and
- (3) A supplement equal to \$797.64 per year per child under 21.

The maximum total allowance is 100% of current salary.

Accidental Death Benefit

Eligibility

Death due to an occupational injury.

Allowance

An immediate allowance equal to:

- (1) A lump sum payment equal to the accumulated deductions at death; and
- (2) A pension equal to 72% of current salary and payable to the surviving spouse, dependent children, or the dependent parents; and

Schedule B - Summary of System Provisions (continued)

- (3) A supplement of \$312 per year per child payable to the spouse or legal guardian until all children reach age 21, unless handicapped.

The maximum total allowance is 100% of current salary.

Death in Active Service

Eligibility

Death of a member due to a non-occupational injury.

Allowance

An immediate allowance that would have been payable had the member retired and elected the 2/3 joint and survivor option on the day before his death. For death occurring prior to the minimum superannuation retirement age, the age 55 (age 60 if hired after April 1, 2012) and age 45 (age 55 if hired after April 1, 2012) accrual rates are used, respectively, for Group 1 and Group 4 members.

For members with at least 2 years of service at death, the surviving spouse receives an additional allowance equal to the sum of \$1,440 per year for the first child and \$1,080 per year for each additional child.

The maximum total allowance is 100% of salary at the date of death.

Normal Form of Benefit

Reduced modified cash refund annuity.

Optional Forms of Benefit

- (1) Life annuity.
- (2) Modified cash refund annuity.
- (3) 66-2/3% joint and survivor allowance.

Return of Contribution

If no other benefit is payable upon termination, the member's accumulated deductions are returned.

Post-Retirement Adjustments

Up to 3% of the annual retirement allowance up to a maximum of \$360 annually.

Member Contributions

Members contribute a percentage of annual regular compensation in accordance with their respective dates of hire, as shown below:

Date of Hire	Rate of Contribution
Prior to January 1, 1975	5%
On or after January 1, 1975	7%
On or after January 1, 1984	8%
On or after July 1, 1996	9%

Members hired on or after January 1, 1979 contribute an additional 2% of compensation in excess of \$30,000.

The contribution rate for Group 1 participants hired on or after April 2, 2012 and who attain 30 years of service is reduced by three percentage points.

Schedule C - Membership Tables

Table 1 – Age/Service Distribution with Salary as of January 1, 2014

Attained Age	Average Salary									
	< 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
20-24	63 14,564	1 23,429								64 14,703
25-29	117 17,599	23 31,628								140 19,903
30-34	84 23,936	45 49,615	7 47,749							136 33,659
35-39	61 23,591	41 59,088	49 66,313	17 72,192						168 49,632
40-44	68 21,137	47 37,885	59 67,154	76 75,831	7 67,468	1 51,732				258 52,198
45-49	41 24,134	51 30,684	53 40,685	71 64,411	15 80,554	9 81,612	1 131,790			241 47,131
50-54	43 21,864	41 28,301	48 40,745	44 47,657	19 66,749	37 86,049	7 122,692			239 47,967
55-59	24 21,856	32 37,243	57 40,868	73 39,998	19 44,647	22 71,350	12 82,772	10 90,036	1 56,482	250 45,335
60-64	14 22,192	19 29,186	24 27,291	41 37,296	16 42,947	29 43,320	8 78,716	8 64,602	4 89,727	163 39,866
65-69	4 22,014	6 21,484	10 34,711	10 37,793	7 43,952	7 56,161	2 93,391	2 44,342	5 57,907	53 41,656
70+		2 18,961	6 36,725	2 24,880		2 75,521	2 74,161	2 23,345	2 65,007	18 43,561
Total Employees	519	308	313	334	83	107	32	22	12	1,730
Average Salary	20,649	38,393	48,593	55,501	57,734	68,600	92,148	70,570	69,578	42,634

Schedule C - Membership Tables (continued)

Table 2 - The Number and Annual Pensions of Retired Members Distributed by Age as of January 1, 2014

Age	Service Retirements		Disability Retirements		Beneficiaries	
	Number	Annual Pension	Number	Annual Pension	Number	Annual Pension
Under 20	0	0	0	0	1	260
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	2	38,078	1	21,432
40 - 44	0	0	7	300,996	1	28,700
45 - 49	0	0	10	565,001	1	6,180
50 - 54	5	131,591	9	388,562	3	58,529
55 - 59	24	952,911	15	577,031	7	127,680
60 - 64	110	4,693,948	27	1,222,569	12	256,312
65 - 69	191	6,913,167	43	2,008,388	26	560,638
70 - 74	171	5,297,263	33	1,351,778	24	472,968
75 - 79	134	3,439,973	17	677,548	25	420,425
80 - 84	113	2,128,037	14	483,639	35	562,346
85 - 89	79	1,136,886	7	204,138	42	590,691
90 - 94	41	488,266	2	83,840	18	228,376
95 - 99	6	46,722	0	0	4	85,502
100 and over	0	0	0	0	1	15,183
Total	874	25,228,764	186	7,901,568	201	3,435,223

Schedule D - Valuation Results by Group - Breakouts

	Total	All Others/City of Brockton	Brockton Redevelopment Authority	Brockton Housing Authority	Brockton Area Transit
(1) Participants					
(a) Actives	1,730	1,655	6	64	5
(b) Retirees and Beneficiaries	1,075	1,027	4	44	0
(c) Vested	0	0	0	0	0
(d) Inactive (Refund)	394	389	1	3	1
(e) Disabled Retirees	<u>186</u>	<u>183</u>	<u>1</u>	<u>2</u>	<u>0</u>
(f) Total	3,385	3,254	12	113	6
(2) Payroll of Active Participants	73,756,821	69,675,322	356,475	3,363,153	361,871
Percent of Total Payroll	100.00%	94.47%	0.48%	4.56%	0.49%
(3) Normal Cost					
(a) Total Normal Cost	11,641,512	11,123,650	79,212	405,954	32,696
(b) Expected Employee Contributions	6,726,782	6,354,540	32,511	306,727	33,003
(c) Administrative Expenses	<u>707,200</u>	<u>675,741</u>	<u>4,812</u>	<u>24,661</u>	<u>1,986</u>
(d) Net Employer Normal Cost (a) - (b) + (c)	5,621,930	5,444,851	51,513	123,888	1,679
(4) Actuarial Accrued Liability	554,569,401	529,068,562	1,345,852	22,444,242	1,710,745
(5) Assets*	<u>373,185,143</u>	<u>362,724,675</u>	<u>524,554</u>	<u>8,747,773</u>	<u>1,188,141</u>
(6) Unfunded Actuarial Accrued Liability (4) - (5)	181,384,258	166,343,887	821,298	13,696,469	522,604
(7) Amortization of unfunded accrued liability	13,239,286	12,141,485	59,947	999,709	38,145
(8) ERI	69,703	0	0	69,703	0
(9) Total Required Employer Contributions (3d) + (7) + (8)	18,930,919	17,586,336	111,460	1,193,300	39,824
(10) Fiscal 2016 Cost	19,289,967	17,945,220	107,963	1,194,436	42,348
(11) Fiscal 2016 Cost - Assuming late payment for Housing	19,337,744	17,945,220	107,963	1,242,213	42,348
(12) Percentage of total	100.00%	93.03%	0.56%	6.19%	0.22%
2017 Normal Cost	5,793,708	5,611,217	53,087	127,674	1,730
2017 ERI	69,703	0	0	69,703	0
2017 Amortization of unfunded accrued liability	14,545,848	13,339,707	65,863	1,098,369	41,909
(13) Fiscal 2017 Cost	21,207,788	19,692,242	123,616	1,346,579	45,351
(14) Fiscal 2017 Cost - Assuming late payment for Housing	21,261,651	19,692,242	123,616	1,400,442	45,351
(15) Percentage of total	100.00%	92.85%	0.58%	6.35%	0.21%

Census information is as of January 1, 2014 and projected to the valuation date using the plan's demographic assumptions assuming no gains or losses.

* Allocation of assets based on the ratio of the Actuarial Accrued Liability, adjusted by a credit of \$156,575,650 for the City of Brockton and the 1/1/2008 transfer of assets for the BAT of \$264,995. See page 29 for more detail on this allocation.

Schedule D - Valuation Results by Group – Breakouts (continued)

Allocation of Assets for Breakouts Exhibit

1. City of Brockton Credit		
(a) Bond issued 12/1/2005	\$	100,000,000
(b) 2005 contribution shortfall		(3,143,836)
(c) Credit as of 1/1/2006 (one month of interest at 6.67%)		97,394,772
(d) Credit as of 1/1/2007 (interest at 12.55%)		109,617,816
(e) Credit as of 1/1/2008 (interest at 7.01%)		117,302,025
(f) Credit as of 1/1/2009 (interest at -29.26%)		82,979,452
(g) Credit as of 1/1/2010 (interest at 23.60%)		102,562,603
(h) Credit as of 1/1/2011 (interest at 13.46%)		116,367,529
(i) Credit as of 1/1/2012 (interest at 0.10%)		116,483,897
(j) Credit as of 1/1/2013 (interest at 12.27%)		130,776,471
(k) Credit as of 1/1/2014 (interest at 12.42%)		147,018,909
(l) Credit as of 1/1/2015 (interest at 6.12%)		156,016,466
(m) Total Brockton Market Value of Assets as of 1/1/2015		371,991,381
(n) Total Brockton Actuarial Value of Assets as of 1/1/2015		373,185,143
(o) Actuarial Value of Assets allocated to City of Brockton Credit $(l) \times (n) / (m)$		156,517,140
2. BAT Actuarial Value of Assets		
(a) BAT Market Value of Assets as of 1/1/2008	\$	264,995
(b) End of year employer contribution		40,000
(c) Mid-year employee contributions		28,609
(d) Interest at -29.26%		(82,084)
(e) BAT Market Value of Assets as of 1/1/2009		251,520
(f) End of year employer contribution		83,217
(g) Mid-year employee contributions		32,105
(h) Interest at 23.60%		62,947
(i) BAT Market Value of Assets as of 1/1/2010		429,788
(j) End of year employer contribution		83,384
(k) Mid-year employee contributions		33,785
(l) Interest at 13.46%		60,051
(m) BAT Market Value of Assets as of 1/1/2011		607,009
(n) End of year employer contribution		50,758
(o) Mid-year employee contributions		33,332
(p) Interest at 0.10%		624

Schedule D - Valuation Results by Group – Breakouts (continued)

Allocation of Assets for Breakouts Exhibit (continued)

(q)	BAT Market Value of Assets as of 1/1/2012	691,723
(r)	End of year employer contribution	53,411
(s)	Mid-year employee contributions	33,857
(t)	Interest at 12.27%	86,891
(u)	BAT Market Value of Assets as of 1/1/2013	865,882
(v)	End of year employer contribution	48,553
(w)	Mid-year employee contributions	26,164
(x)	Interest at 12.42%	109,120
(y)	BAT Market Value of Assets as of 1/1/2014	1,049,719
(z)	End of year employer contribution	42,348
(aa)	Mid-year employee contributions	27,211
(ab)	Interest at 6.12%	65,063
(ac)	BAT Market Value of Assets as of 1/1/2015	1,184,341
(ad)	BAT Actuarial Value of Assets as of 1/1/2015 (ac) x (1n) / (1m)	1,188,141
3.	Actuarial Value of Assets remaining after City of Brockton Credit and BAT are excluded	
(a)	Total Brockton Actuarial Value of Assets as of 1/1/2015	\$ 373,185,143
(b)	City of Brockton Credit (10)	156,517,140
(c)	Actuarial Value of Assets allocated to BAT (2ad)	1,188,141
(d)	Remaining AVA (a) - (b) - (c)	215,479,862
4.	BRA Actuarial Value of Assets	
(a)	BRA Accrued Liability as of 1/1/2015	\$ 1,345,852
(b)	Total non-BAT Accrued Liability as of 1/1/2015	552,858,656
(c)	BRA Actuarial Value of Assets (3d) x (a) / (b)	524,554
5.	BHA Actuarial Value of Assets	
(a)	BHA Accrued Liability as of 1/1/2015	\$ 22,444,242
(b)	Total non-BAT Accrued Liability as of 1/1/2015	552,858,656
(c)	BHA Actuarial Value of Assets (3d) x (a) / (b)	8,747,773
6.	City of Brockton Actuarial Value of Assets	
(a)	Total Actuarial Value of Assets as of 1/1/2015	\$ 373,185,143
(b)	BAT Actuarial Value of Assets as of 1/1/2015 (2ad)	1,188,141
(c)	BRA Actuarial Value of Assets as of 1/1/2015 (4c)	524,554
(d)	BHA Actuarial Value of Assets as of 1/1/2015 (5c)	8,747,773
(e)	City of Brockton Actuarial Value of Assets as of 1/1/2015 (a) - (b) - (c) - (d)	362,724,675

Schedule E - Projection of Expected Pension Payments

Year	Amount	Year	Amount
2015	\$ 40,114,262	2040	\$ 64,235,580
2016	41,084,466	2041	63,732,641
2017	42,152,470	2042	63,003,690
2018	43,373,633	2043	62,104,525
2019	44,610,115	2044	61,076,520
2020	45,856,984	2045	59,798,628
2021	47,135,284	2046	58,422,539
2022	48,383,602	2047	56,888,874
2023	49,644,160	2048	55,228,467
2024	51,059,049	2049	53,603,065
2025	52,433,112	2050	51,828,506
2026	53,897,549	2051	50,002,905
2027	55,268,437	2052	48,140,475
2028	56,637,437	2053	46,208,772
2029	57,858,484	2054	44,254,344
2030	59,062,326	2055	42,240,125
2031	60,238,432	2056	40,189,421
2032	61,306,302	2057	38,131,498
2033	62,190,308	2058	36,058,255
2034	62,950,790	2059	33,983,999
2035	63,813,549	2060	31,924,080
2036	64,324,948	2061	29,878,096
2037	64,649,640	2062	27,852,111
2038	64,734,192	2063	25,858,959
2039	64,568,407	2064	23,902,813

Schedule F - GASB 68 Information

1. The determination of the average expected remaining service lives of all members, as follows:

Group	Remaining Service Lives		
	Number	Service	Average
Retired paid from fund	1,261	0	
Terminated with deferred benefit	394	0	
Active	<u>1,730</u>	<u>19,353</u>	
Total	3,385	19,353	5.72

2. The determination of pension expense for the fiscal year as shown below:

Pension Expense	Fiscal Year Ending June 30, 2015
Service Cost	\$ 10,817,393
Interest Cost on Total Pension Liability	41,739,197
Differences between Expected and Actual Experience	-
Changes of Assumptions	3,035,692
Contributions-Member	(8,467,701)
Projected Earnings on Plan Investments	(28,941,172)
Differences between Projected and Actual Earnings	2,620,747
Administrative Expenses	677,927
Other	406,376
Total Pension Expense	\$ 21,888,459

3. The schedule of changes in Net Pension Liability:

Change in Net Pension Liability	Fiscal Year Ending June 30, 2015
Net pension liability at June 30, 2014	\$ 162,150,866
Changes for the year:	
Service Cost	10,817,393
Interest Cost of Total Pension Liability	41,739,197
Projected Earnings on Plan Investments	(28,941,172)
Contributions-Employer	(19,332,315)
Contributions-Member	(8,467,701)
Administrative Expenses	677,927
Plan Changes	-
Deferred Inflows/(Outflows)	
Changes in Assumptions	17,356,197
Differences between Expected and Actual Liability Experience	-
Difference between Projected and Actual Earnings	13,103,736
Other	406,376
Net Change in Net Pension Liability	27,359,638
Net pension liability at June 30, 2015	\$189,510,504

Schedule F - GASB 68 Information (continued)

4. Following is a schedule illustrating the recognition in pension expense of differences between expected and actual experience:

Schedule of Difference between Actual and Expected Experience

Measurement Year: 2015

Amount Established: -

Recognition Period: 5.72

Annual Recognition: -

Amount Recognized

2015 -

2016 -

2017 -

2018 -

2019 -

2020 -

2021 -

2022 -

2023 -

2024 -

2025 -

2026 -

2027 -

Deferred Balance

2015 -

2016 -

2017 -

2018 -

2019 -

2020 -

2021 -

2022 -

2023 -

2024 -

2025 -

2026 -

2027 -

Schedule F - GASB 68 Information (continued)

5. Following is a schedule illustrating the recognition in pension expense of changes in assumptions:

Schedule of Changes in Assumptions

Measurement Year:	2015
Amount Established:	17,356,197
Recognition Period:	5.72
Annual Recognition:	3,035,692

Amount Recognized

2015	3,035,692
2016	3,035,692
2017	3,035,692
2018	3,035,692
2019	3,035,692
2020	2,177,737
2021	-
2022	-
2023	-
2024	-
2025	-
2026	-
2027	-

Deferred Balance

2015	14,320,505
2016	11,284,813
2017	8,249,121
2018	5,213,429
2019	2,177,737
2020	-
2021	-
2022	-
2023	-
2024	-
2025	-
2026	-
2027	-

Schedule F - GASB 68 Information (continued)

6. Following is a schedule illustrating the recognition in pension expense of differences between projected and actual earnings on pension plan investments:

Schedule of Differences between Projected and Actual Earnings

Measurement Year:	2015
Amount Established:	13,103,736
Recognition Period:	5.00
Annual Recognition:	2,620,747

Amount Recognized

2015	2,620,747
2016	2,620,747
2017	2,620,747
2018	2,620,747
2019	2,620,748
2020	-
2021	-
2022	-
2023	-
2024	-
2025	-
2026	-
2027	-

Deferred Balance

2015	10,482,989
2016	7,862,242
2017	5,241,495
2018	2,620,748
2019	-
2020	-
2021	-
2022	-
2023	-
2024	-
2025	-
2026	-
2027	-

Schedule G - Net Pension Liability Allocations as of June 30, 2014 and June 30, 2015 by Employer

Employer Name	Fiscal Year Ended June 30, 2014		Fiscal Year Ended June 30, 2015				
	Employer Proportion	Net Pension Liability	Employer Proportion	Proportionate Share of Total Contributions	Net Pension Liability	Net Pension Liability: 1% Decrease	Net Pension Liability: 1% Increase
All Others/City of Brockton	93.0288%	150,846,964	93.0288%	18,037,764	176,299,300	230,164,405	130,364,102
Brockton Redevelopment Authority	0.5597%	907,534	0.5597%	102,688	1,060,661	1,384,727	784,304
Brockton Housing Authority	6.1920%	10,040,392	6.1920%	1,100,962	11,734,503	15,319,770	8,677,050
Brockton Area Transit	0.2195%	355,976	0.2195%	48,553	416,040	543,153	307,640
Total	100.0000%	\$ 162,150,866	100.0000%	\$ 19,289,967	\$ 189,510,504	\$ 247,412,055	\$ 140,133,096

Schedule H - Allocations of Pension Amounts as of June 30, 2015 by Employer

Employer Name	Employer Proportion	Net Pension Liability	Deferred Outflows of Resources					Deferred Inflows of Resources					Pension Expense Recognized				
			Difference Between Expected and Actual Experience	Changes in Assumptions	Changes in Benefits	Difference Between Projected and Actual Investment Earnings	Changes in Proportional Share Of Contributions	Difference Between Expected and Actual Experience	Changes in Assumptions	Changes in Benefits	Difference Between Projected and Actual Investment Earnings	Changes in Proportional Share Of Contributions	Difference Between Employer Contributions and Proportionate Share of Total Contributions	Proportionate Share of Pension Plan Expense	Change in Proportional Share Of Contributions	Total	
All Others/City of Brockton	93.0288%	176,299,300	0	13,322,190	0	9,752,196	0	0	0	0	0	0	0	0	20,362,565	0	20,362,565
Brockton Redevelopment Authority	0.5597%	1,060,661	0	80,150	0	58,672	0	0	0	0	0	0	0	0	122,506	0	122,506
Brockton Housing Authority	6.1920%	11,734,503	0	886,727	0	649,107	0	0	0	0	0	0	0	0	1,355,335	0	1,355,335
Brockton Area Transit	0.2195%	416,040	0	31,438	0	23,014	0	0	0	0	0	0	0	0	48,053	0	48,053
Total	100.0000%	\$ 189,510,504	\$ 0	\$ 14,320,505	\$ 0	\$ 10,482,989	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 21,888,459	\$ 0	\$ 21,888,459

Schedule I - Employers' Proportionate Share of the June 30, 2015 Deferred Outflows/Inflows

Employer Name	Fiscal Year Ending						Total
	June 30, 2015	June 30, 2016	June 30, 2017	June 30, 2018	June 30, 2019	Thereafter	
All Others/City of Brockton	5,262,116	5,262,116	5,262,116	5,262,116	5,262,117	2,025,923	28,336,504
Brockton Redevelopment Authority	31,658	31,658	31,658	31,658	31,658	12,188	170,478
Brockton Housing Authority	350,247	350,247	350,247	350,247	350,247	134,845	1,886,080
Brockton Area Transit	12,418	12,418	12,418	12,418	12,418	4,781	66,871
Total	\$ 5,656,439	\$ 5,656,439	\$ 5,656,439	\$ 5,656,439	\$ 5,656,440	\$ 2,177,737	\$ 30,459,933