

Employees Retirement Plan of the Town of Hamden

Actuarial Valuation and Review as of
July 1, 2016





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January 5, 2017

Retirement Board

Employees Retirement Plan of the Town of Hamden

c/o Mayor Curt Balzano Leng

Hamden Government Center

2750 Dixwell Avenue

Hamden, CT 06518-3320

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of July 1, 2016. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for the year ending June 30, 2017.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement Plan. The census information on which our calculations were based was prepared by the staff of the Town of Hamden, and the financial information was provided by Buckley, Frame, Boudreau & Co., P.C. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the smoothing of asset gains and losses); and changes in plan provisions or applicable law.

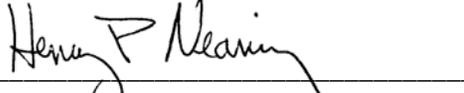
The actuarial calculations were directed under the supervision of Deborah K. Brigham, FCA, ASA, MAAA, Enrolled Actuary. Ms. Brigham is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

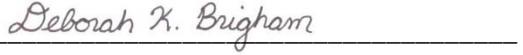
To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Town are reasonably related to the experience of and the expectations for the Plan.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: 
Henry P. Nearing, MAAA, EA
Vice President and Consulting Actuary


Deborah K. Brigham, FCA, ASA, MAAA, EA
Vice President and Actuary

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SECTION 1: Valuation Summary for the Employees Retirement Plan of the Town of Hamden

Purpose

This report has been prepared by Segal Consulting to present a valuation of the Employees Retirement Plan of the Town of Hamden as of July 1, 2016. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Plan, as administered by the Board;
- The characteristics of covered active participants, inactive vested participants, and retired participants and beneficiaries as of June 30, 2016, provided by the Town;
- The assets of the Plan as of June 30, 2016, provided by the Auditor;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

Significant Issues in Valuation Year

1. The actuarially recommended contribution (“ARC”) is \$21,067,247 for the year ending June 30, 2017. This is a decrease of \$930,866 since the last valuation, primarily resulting from assumption changes. The unfunded liability is amortized over a 30-year period, with 28 years remaining as of the valuation date. The amortization assumes 2% annual increases in the payments, which is tied to the Town’s expected budgetary increases.
2. The following assumptions have been revised with this valuation:
 - The CPI-based COLA is assumed to be 2.25% per year, down from 3.00%. This change lowered the unfunded liability by \$32,757,237 and decreased the recommended contribution by \$2,584,755.
 - The mortality tables were adjusted to add five additional years of improvement with Scale BB, which increased unfunded liability by \$6,085,033 and increased the recommended contribution by \$443,307.
 - The assumed administrative expenses for the plan year increased from \$100,000 to \$115,000.
3. Public Act 14-217, adopted by the Connecticut General Assembly in June 2014, allows the Town to “ramp up” its ARC to the Retirement Plan. The ARC for the year ending June 30, 2016 was \$21,998,113; the Town contributed \$12,100,000 (55%), as required. For the fiscal year ending June 30, 2017, the Town is required to contribute at least 70% of the current ARC, or \$14,747,073. The ARC will be updated annually, and the required contribution percentage will climb to 80% next year, and 100% thereafter.

SECTION 1: Valuation Summary for the Employees Retirement Plan of the Town of Hamden

4. The investment rate of return on an actuarial basis for the year ended June 30, 2016 was 4.75%. Since the rate of return was less than the assumed rate of return of 7.00% per year, there was an actuarial investment loss amounting to \$3.7 million. The return on a market value basis was 0.93%. The smoothed actuarial value of assets is 106.6% of the market value of assets as of the valuation date, and there are deferred losses of \$10.2 million. Chart 11 on page 9 details the Plan's actuarial value and market value returns over the last ten years.
5. The Retirement Plan pays cost-of-living adjustments (COLAs) to annuitants based on increases in the Consumer Price Index (CPI). The CPI change from January 2015 to January 2016 was 1.37%. Since the assumption for annual COLAs was 3.00%, there was an experience gain for the year related to inflation. This gain was offset by a loss due to other experience. The net experience loss from sources other than investments was 0.3% of liability.
6. The Town currently uses an assumed interest rate of 7.00% for the valuation, and this rate has been maintained based on discussions with the Town's investment consultant regarding future expectations. Had the rate been lowered to 6.50% and reflected along with the assumption changes noted above, the recommended contribution would be \$1,335,745 higher, at \$22,402,992. We will continue to monitor the Town's investment experience in future valuations.
7. The Plan's funded status on an actuarial basis increased from 36.89% to 37.39% between 2015 and 2016. The market value of assets decreased from \$163.6 million to \$154.8 million; the smoothed actuarial value of assets decreased from \$167.6 million to \$165.1 million. On a market value basis, the funded ratio decreased from 36.01% to 35.07%.
8. Page iv in Section 1 of this report contains a contribution split between Town, Board of Education, and Guardians. Assets have been allocated to each group based upon the Plan's overall funded percentage.
9. The Plan is closed to new entrants, and the number of active participants is declining due to retirements and other attrition. Over the year, the active population has declined by about 4%, from 425 to 408.
10. This valuation report includes the required accounting information for compliance with Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans*, and Statement No. 68, *Accounting and Financial Reporting for Pensions* in Section 5.
11. The actuarial valuation report as of July 1, 2016 is based on financial information as of June 30, 2016. Changes in the value of assets subsequent to that date are not reflected. Unfavorable asset experience will increase the actuarial cost of the Plan, while favorable experience will decrease the actuarial cost of the Plan.

SECTION 1: Valuation Summary for the Employees Retirement Plan of the Town of Hamden

Summary of Key Valuation Results

	2016	2015
Contributions for plan year beginning July 1:		
Recommended contribution	\$21,067,247	\$21,998,113
Actual employer contribution	--	12,100,000
Funding elements for plan year beginning July 1:		
Total normal cost, including administrative expenses	\$4,997,866	\$5,603,110
Market value of assets	154,834,124	163,625,653
Actuarial value of assets	165,080,700	167,629,557
Actuarial accrued liability	441,521,657	454,439,941
Unfunded actuarial accrued liability	276,440,957	286,810,384
Funded ratio – market value basis	35.07%	36.01%
Funded ratio – actuarial value basis	37.39%	36.89%
Demographic data for plan year beginning July 1:		
Number of retired participants and beneficiaries	722	726
Number of vested former participants	24	22
Number of active participants	408	425
Total salary	\$28,397,008	\$28,992,189
Average salary	69,601	68,217

SECTION 1: Valuation Summary for the Employees Retirement Plan of the Town of Hamden

Development of the Recommended Contribution By Group				
	Service (Town)	Service (Board of Ed)	Guardian	Total
1. a) Total normal cost	\$1,169,225	\$1,002,330	\$2,711,311	\$4,882,866
b) Projected administrative expenses	33,179	18,647	63,174	115,000
c) Projected employee contributions	<u>590,345</u>	<u>473,596</u>	<u>1,079,429</u>	<u>2,143,370</u>
d) Town normal cost: (a) + (b) – (c)	\$612,059	\$547,381	\$1,695,056	\$2,854,496
2. Accrued liability				
a) Active employees	\$36,598,480	\$29,682,627	\$79,453,348	\$145,734,455
b) Vested terminated	1,842,667	601,005	64,231	2,507,903
c) Retirees	74,584,684	36,691,077	133,944,497	245,220,258
d) Beneficiaries	5,545,734	3,115,087	7,335,388	15,996,209
e) Disability retirees	<u>8,814,080</u>	<u>1,502,602</u>	<u>21,746,150</u>	<u>32,062,832</u>
f) Total accrued liability	\$127,385,645	\$71,592,398	\$242,543,614	\$441,521,657
3. Assets at actuarial value	47,628,267	26,767,709	90,684,724	165,080,700
4. Unfunded accrued liability: (2f) - (3)	\$79,757,378	\$44,824,689	\$151,858,890	\$276,440,957
5. Payment on unfunded accrued liability				
a) Factor	15.796327	15.796327	15.796327	15.796327
b) Payment	\$5,049,110	\$2,837,665	\$9,613,557	\$17,500,332
c) Amortization years	28	28	28	28
d) Interest rate (adjusted for amortization with 2% annual growth)	4.90%	4.90%	4.90%	4.90%
6. Annual Town cost for 2015-2016 Fiscal Year				
a) Recommended contribution at beginning of year: (1d) + (5b)	\$5,661,169	\$3,385,046	\$11,308,613	\$20,354,828
b) Recommended contribution at middle of year: (6a) x 1.035	5,859,310	3,503,523	11,704,414	21,067,247

SECTION 1: Valuation Summary for the Employees Retirement Plan of the Town of Hamden

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal Consulting (“Segal”) relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by the Town of Hamden. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** The valuation is based on the market value of assets as of the valuation date, as provided by the auditor. The Town uses an “actuarial value of assets” that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

SECTION 1: Valuation Summary for the Employees Retirement Plan of the Town of Hamden

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the Town of Hamden. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- If the Town is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Town should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

A. PARTICIPANT DATA

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, vested terminated participants, retired participants and beneficiaries. This section presents a summary of significant statistical data on these participant groups.

The Plan has been closed to new entrants since 2007, and therefore the number of active participants is declining. As shown on the next page, the average age, service and salary of the active population in the Plan are increasing.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A, B, and C.

A historical perspective of how the participant population has changed over the past ten valuations can be seen in this chart.

CHART 1

Participant Population: 2000 – 2016

Year Ended June 30	Active Participants	Vested Terminated Participants*	Retired Participants and Beneficiaries**	Ratio of Non-Actives to Actives
2000	611	19	563	0.95
2002	626	17	590	0.97
2004	640	18	617	0.99
2006	628	19	657	1.08
2008	638	21	645	1.04
2010	568	27	664	1.22
2012	509	30	704	1.44
2014	437	24	737	1.74
2015	425	22	726	1.76
2016	408	24	722	1.83

*Excludes terminated participants due a refund of employee contributions

**Includes disabled retirees

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

Active Participants

Plan costs are affected by the age, years of credited service and salaries of active participants. In this year's valuation, there were 408 active participants with an average age of 52.0, average years of credited service of 16.8 years and average salaries of \$69,601. The 425 active participants in the prior valuation had an average age of 51.1, average service of 16.0 years and average salaries of \$68,217.

Inactive Participants

In this year's valuation, there were 24 participants with a vested right to a deferred or immediate vested benefit.

These graphs show a distribution of active participants by age and by years of credited service.

CHART 2
Distribution of Active Participants by Age as of June 30, 2016

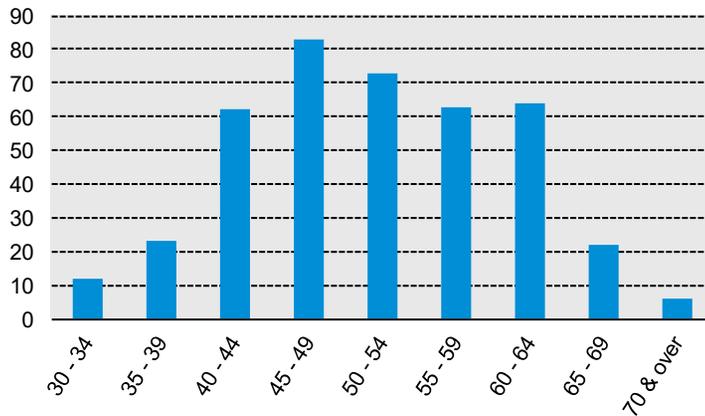
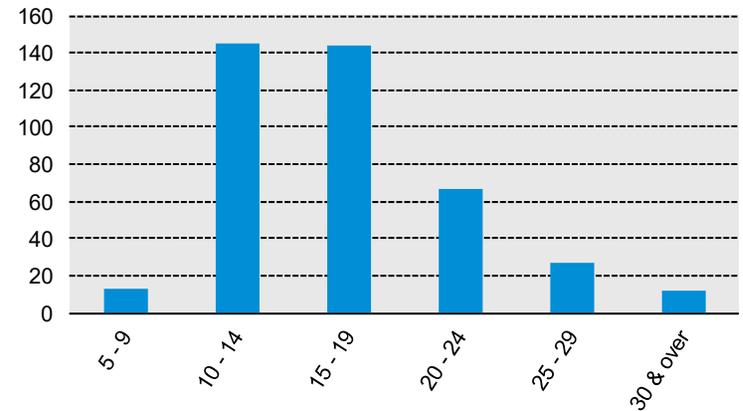


CHART 3
Distribution of Active Participants by Years of Credited Service as of June 30, 2016



SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

Retired Participants and Beneficiaries

As of June 30, 2016, 609 retired participants and 113 beneficiaries were receiving total monthly benefits of \$2,049,798. For comparison, in the previous valuation, there were 614 retired participants and 112 beneficiaries receiving monthly benefits of \$2,018,585.

The retired participant count also includes 85 participants receiving a disability pension. For the prior valuation, there were 86 participants receiving a disability pension.

These graphs show a distribution of the current retired participants and beneficiaries based on their monthly amount and age, by type of pension.

CHART 4
Distribution of Retired Participants and Beneficiaries by Type and by Monthly Amount as of June 30, 2016

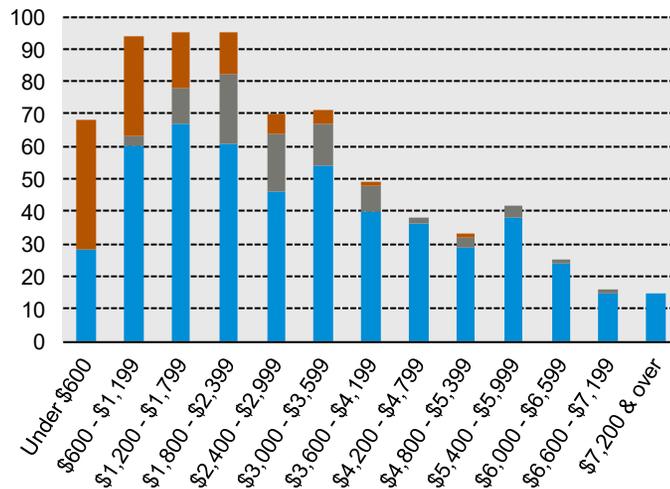
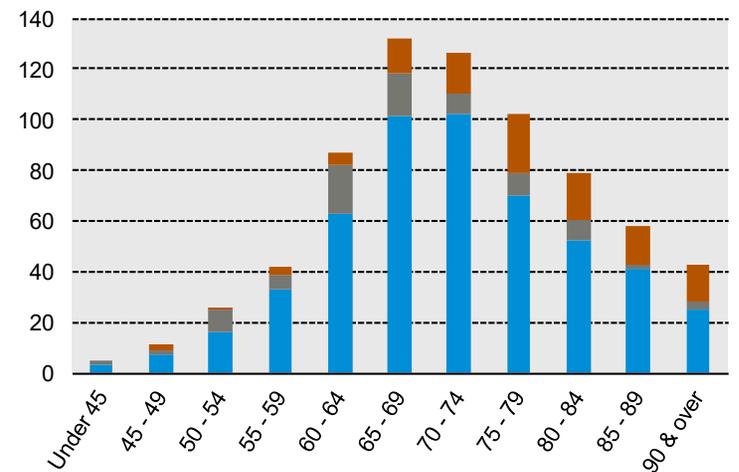


CHART 5
Distribution of Retired Participants and Beneficiaries by Type and by Age as of June 30, 2016



SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

B. FINANCIAL INFORMATION

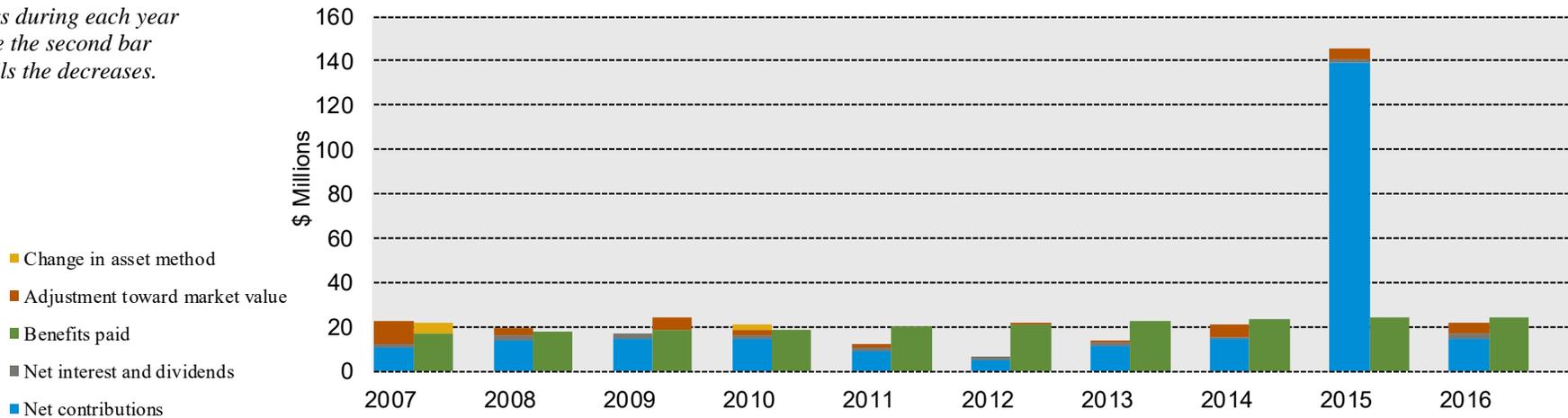
Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits D, E and F.

The chart depicts the components of changes in the actuarial value of assets over the last ten years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.

CHART 6

Comparison of Increases and Decreases in the Actuarial Value of Assets for Years Ended June 30, 2007 – 2016



Notes: The net contributions for the year ended June 30, 2015 include \$122,303,087 in funds from a pension deficit funding bond issue.

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

The chart shows the determination of the actuarial value of assets as of the valuation date.

CHART 7

Determination of Actuarial Value of Assets for Year Ended June 30, 2016

1. Market value of assets, June 30, 2016			\$154,834,124
2. Calculation of unrecognized return	Original Amount*	Unrecognized Return**	
(a) Year ended June 30, 2016	-\$9,625,872	-\$7,700,698	
(b) Year ended June 30, 2015	-7,171,787	-4,303,072	
(c) Year ended June 30, 2014	3,664,498	1,465,799	
(d) Year ended June 30, 2013	1,456,974	291,395	
(e) Year ended June 30, 2012	-5,239,816	0	0
(f) Total unrecognized return			-10,246,576
3. Preliminary actuarial value: (1) - (2f)			165,080,700
4. Adjustment to be within 20% corridor			0
5. Final actuarial value of assets as of June 30, 2016: (3) + (4)			<u>\$165,080,700</u>
6. Actuarial value as a percentage of market value: (5) ÷ (1)			106.6%
7. Amount deferred for future recognition: (1) - (5)			-\$10,246,576

*Total return minus expected return on a market value basis

**Recognition at 20% per year over five years

***Deferred return as of June 30, 2016 recognized in each of the next four years:

(a) Amount recognized on June 30, 2017	-\$2,335,237	(c) Amount recognized on June 30, 2019	-\$3,359,532
(b) Amount recognized on June 30, 2018	-2,626,632	(d) Amount recognized on June 30, 2020	-1,925,174

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

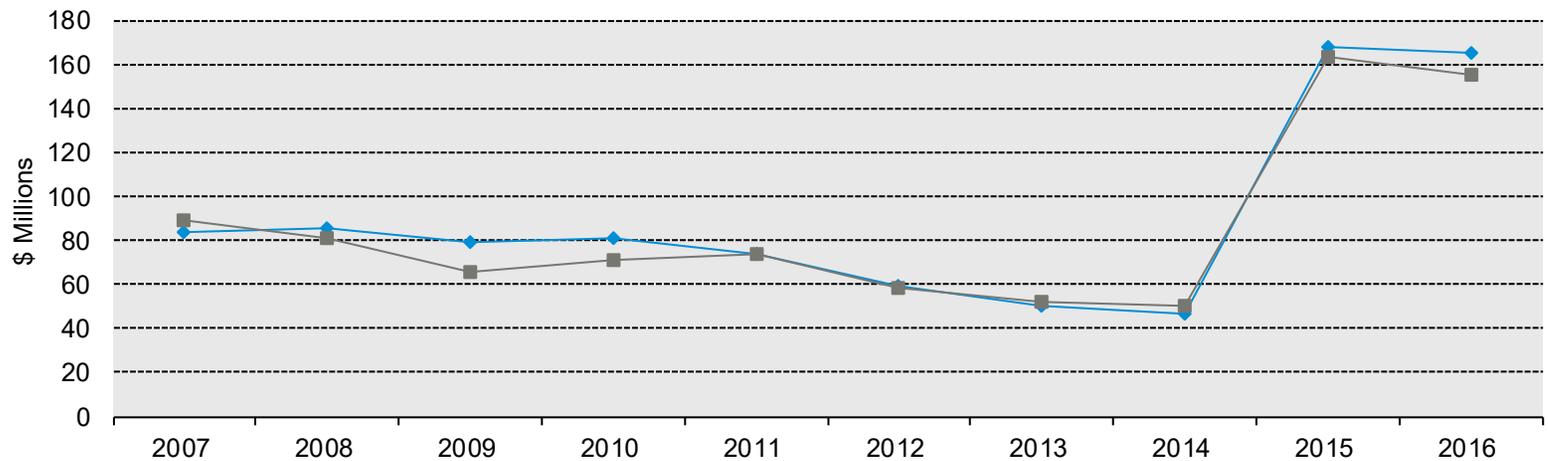
Both the actuarial value and market value of assets are representations of the Retirement Plan’s financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Retirement Plan’s liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

Chart 8 provides a ten-year history of the Plan’s assets. As of the 2014 valuation date, the market value of assets was \$50.1 million and the funded ratio was 10%. In March of 2015, the Plan received \$122.3 million in funding through a pension deficit funding bond issuance. The current funded ratio is 37.39%, and is scheduled to increase if the Town complies with funding requirements.

This chart shows the change in the actuarial value of assets versus the market value over the past ten years.

CHART 8

Actuarial Value of Assets vs. Market Value of Assets as of June 30, 2007 – 2016



SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

C. ACTUARIAL EXPERIENCE

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term

development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total loss is \$5,057,039, including \$3,663,473 from investments and \$1,393,565 from all other sources. The net experience variation from individual sources other than investments was 0.3% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

This chart provides a summary of the actuarial experience during the past year.

**CHART 9
Actuarial Experience for Year Ended June 30, 2016**

1. Net loss from investments*	-\$3,663,473
2. Net loss from administrative expenses	-15,734
3. Net loss from other experience**	<u>-1,377,832</u>
4. Net experience loss: (1) + (2) + (3)	-\$5,057,039

* Details in Chart 10

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

Investment Rate of Return

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Retirement Plan’s investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.00%. The actual rate of return on an actuarial basis for the 2015-2016 plan year was 4.75%. The return on a market value basis for the 2015-2016 plan year was 0.93%.

Since the actual return for the year was less than the assumed return, the Retirement Plan experienced an actuarial loss during the year ended June 30, 2016 with regard to its investments.

This chart shows the loss due to investment experience.

CHART 10
Actuarial Value Investment Experience for Year Ended June 30, 2016

1. Actual return	\$7,711,484
2. Average value of assets	162,499,387
3. Actual rate of return: (1) ÷ (2)	4.75%
4. Assumed rate of return	7.00%
5. Expected return: (2) x (4)	\$11,374,957
6. Actuarial loss: (1) – (5)	<u>-\$3,663,473</u>

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last ten years, including five-year and ten-year averages.

Based upon this future expectations and feedback from the Plan's investment consultant, the Board has maintained the assumed rate of return of 7.00%.

CHART 11

Investment Return – Actuarial Value vs. Market Value: 2007 - 2016

Year Ended June 30	Net Interest and Dividend Income		Recognition of Capital Appreciation		Change in Asset Method		Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
2007	\$1,099,579	1.38%	\$11,013,549	13.83%	-\$4,592,217	-5.76%	\$7,520,911	9.44%	\$12,167,710	15.27%
2008	2,614,772	3.18	2,772,270	3.37	--	--	5,387,042	6.55	-3,979,378	-4.58
2009	2,538,945	3.02	-5,762,170	-6.86	--	--	-3,223,225	-3.84	-11,596,521	-14.64
2010	2,095,956	2.73	2,165,727	2.82	2,622,775	3.42	6,884,458	8.98	9,919,425	15.61
2011	1,939,537	2.56	1,292,723	1.71	--	--	3,232,260	4.27	13,450,252	20.50
2012	1,599,444	2.44	-558,524	-0.85	--	--	1,040,920	1.59	13,171	0.02
2013	1,344,143	2.52	591,615	1.11	--	--	1,935,758	3.63	5,127,934	9.78
2014	885,858	1.95	5,030,584	11.10	--	--	5,916,442	13.05	6,996,801	14.70
2015	1,474,885	1.85	4,523,531	5.67	--	--	5,998,416	7.52	-1,355,734	-1.63
2016	2,845,226	1.75	4,866,258	2.99	--	--	7,711,484	4.75	1,468,812	0.93
Total	\$18,438,345		\$25,935,562		-\$1,969,442		\$42,404,465		\$32,212,472	
							Five-year average return	5.56%		3.01%
							Ten-year average return	5.27%		4.12%

Note: Each year's yield is weighted by the average asset value in that year.

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

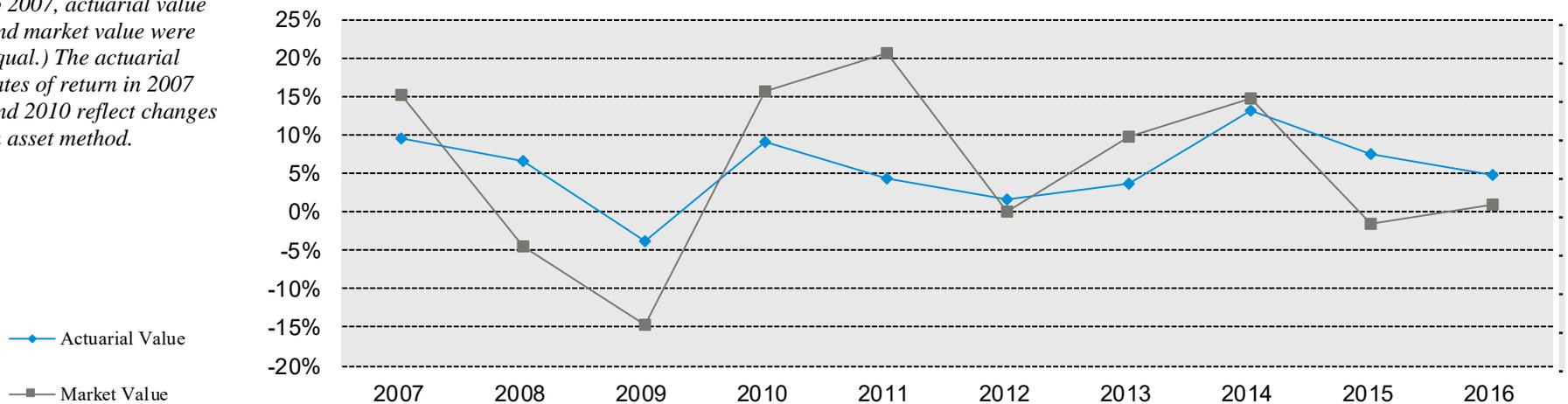
Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

Administrative Expenses

Administrative expenses for the year ended June 30, 2016 totaled \$118,719 compared to the assumption of \$100,000 per year. This resulted in a loss of \$15,734 for the year. We have changed the assumption from \$100,000 to \$115,000 for the current year.

This chart illustrates how this leveling effect has actually worked over the years 2007 - 2016. (Prior to 2007, actuarial value and market value were equal.) The actuarial rates of return in 2007 and 2010 reflect changes in asset method.

CHART 12
Market and Actuarial Rates of Return for Years Ended June 30, 2007 - 2016



SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements,
- salary increases different than assumed, and
- cost-of-living adjustments (COLAs) higher or lower than anticipated.

The net loss from this other experience for the year ended June 30, 2016 amounted to \$1,377,832, which is 0.3% of the actuarial accrued liability.

Assumption Changes

Actuarial Standards of Practice require a provision for future longevity improvement when setting mortality assumptions. The number of deaths has been close to expected in recent years. We have extended the projection period for Scale BB on the mortality table by five years this year, from 2019 to 2024.

The COLA assumption has also been updated. Inflation is low, from a historical perspective. For the ten-year period ended December 31, 2015, the average annual CPI increase was 1.92%. Over 20 years, the average was 2.22%. The Plan has experienced gains in recent years, as the assumed COLA has been 3.00%. The assumption has been lowered to 2.25% with this valuation.

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

D. RECOMMENDED CONTRIBUTION

The amount of annual contribution required to fund the Plan is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability.

The recommended contribution based on a 30-year amortization with 2% annual increases expected. The 2% growth is tied to the Town’s expected budgetary increases. As of July 1, 2016, there are 28 years remaining on this schedule.

The contribution requirements as of July 1, 2016 are based on all of the data described in the previous sections, the actuarial assumptions described in Section 4, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

The chart compares this valuation’s recommended contribution with the prior valuation.

CHART 13
Recommended Contribution

	Year Beginning July 1	
	2016	2015
	Amount	Amount
1. Total normal cost	\$4,882,866	\$5,503,110
2. Administrative expenses	115,000	100,000
3. Expected employee contributions	<u>-2,143,370</u>	<u>-2,209,597</u>
4. Employer normal cost: (1) + (2) + (3)	\$2,854,496	\$3,393,513
5. Actuarial accrued liability	441,521,657	454,439,941
6. Actuarial value of assets	<u>165,080,700</u>	<u>167,629,557</u>
7. Unfunded actuarial accrued liability: (5) - (6)	\$276,440,957	\$286,810,384
8. Payment on unfunded actuarial accrued liability	17,500,332	17,860,702
9. Total recommended contribution: (4) + (8), adjusted for timing*	<u>\$21,067,247</u>	<u>\$21,998,113</u>

**Recommended contributions are assumed to be paid at the middle of every year.*

SECTION 2: Valuation Results for the Employees Retirement Plan of the Town of Hamden

Reconciliation of Recommended Contribution

The chart below details the changes in the recommended contribution from the prior valuation to the current year's valuation.

The chart reconciles the contribution from the prior valuation to the amount determined in this valuation.

CHART 14

Reconciliation of Recommended Contribution from July 1, 2015 to July 1, 2016

Recommended Contribution as of July 1, 2015	\$21,998,113
Net effect of changes in assumptions	-2,125,922
Effect of expected change in amortization payment due to level percent amortization method	369,716
Effect of contributions less than recommended contribution	673,559
Effect of investment loss	240,037
Effect of other gains and losses on accrued liability	91,309
Net effect of other changes	<u>-179,565</u>
Total change	<u>-\$930,866</u>
Recommended Contribution as of July 1, 2016	\$21,067,247

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT A

Table of Plan Coverage

Category	Year Ended June 30		Change From Prior Year
	2016	2015	
Active participants in valuation:			
Number	408	425	-4.0%
Average age	52.0	51.1	N/A
Average years of credited service	16.8	16.0	N/A
Total salary	\$28,397,008	\$28,992,189	-2.1%
Average salary	69,601	68,217	2.0%
Account balances (without interest)	20,770,130	18,743,371	
Total active vested participants	395	378	4.5%
Vested terminated participants	24	22	9.1%
Retired participants:			
Number in pay status	524	528	-0.8%
Average age	70.1	71.1	N/A
Average monthly benefit	\$3,195	\$3,126	2.2%
Disabled participants:			
Number in pay status	85	86	-1.2%
Average age	67.1	66.2	N/A
Average monthly benefit	\$2,904	\$2,850	1.9%
Beneficiaries in pay status:			
Number in pay status	113	112	0.9%
Average age	77.4	77.6	N/A
Average monthly benefit	\$1,141	\$1,098	3.9%

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT B

**Participants in Active Service as of June 30, 2016
By Age, Years of Credited Service, and Average Salary**

Age	Years of Credited Service								
	Total	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
30 - 34	12	1	11	--	--	--	--	--	--
	\$77,560	\$57,329	\$79,399	--	--	--	--	--	--
35 - 39	23	--	18	5	--	--	--	--	--
	80,626	--	83,766	\$69,323	--	--	--	--	--
40 - 44	62	--	27	26	9	--	--	--	--
	78,915	--	74,081	84,962	\$75,946	--	--	--	--
45 - 49	83	4	25	29	18	6	1	--	--
	76,213	47,585	66,585	81,689	91,780	\$64,248	\$64,212	--	--
50 - 54	73	1	21	21	14	14	2	--	--
	68,003	65,691	53,059	62,735	75,753	87,518	90,525	--	--
55 - 59	63	5	18	26	7	5	2	--	--
	58,952	41,388	49,919	61,275	55,398	84,927	101,457	--	--
60 - 64	64	2	18	23	15	1	1	4	--
	61,528	33,532	57,808	57,262	67,862	47,633	90,838	\$89,178	--
65 - 69	22	--	6	12	2	1	--	--	1
	63,810	--	75,111	57,597	61,042	76,773	--	--	\$63,132
70 & over	6	--	1	2	2	--	--	1	--
	62,288	--	33,681	51,618	69,449	--	--	97,912	--
Total	408	13	145	144	67	27	6	5	1
	\$69,601	\$45,182	\$66,094	\$69,074	\$75,564	\$79,992	\$89,836	\$90,925	\$63,132

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT C

Reconciliation of Participant Data

	Active Participants	Vested Former Participants	Disableds	Retired Participants	Beneficiaries	Total
Number as of July 1, 2015	425	22	86	528	112	1,173
New participants	0	N/A	N/A	N/A	N/A	0
Terminations	-3	3	0	0	0	0
Retirements	-13	0	N/A	13	N/A	0
New disabilities	0	0	0	N/A	N/A	0
Deceased	0	0	-1	-16	-7	-24
New beneficiaries	N/A	N/A	N/A	N/A	8	8
Lump sum payoffs	-1	0	0	0	0	-1
Data adjustments	<u>0</u>	<u>-1</u>	<u>0</u>	<u>-1</u>	<u>0</u>	<u>-2</u>
Number as of July 1, 2016	408	24	85	524	113	1,154

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT D

Summary Statement of Income and Expenses on an Actuarial Value Basis

	Year Ended June 30, 2016	Year Ended June 30, 2015
Net assets at actuarial value at the beginning of the year	\$167,629,557	\$46,762,549
Contribution income:		
Income from pension deficit funding bond	\$0	\$122,303,087
Employer contributions	12,100,000	14,768,025
Employee contributions	2,195,488	2,232,086
Less administrative expenses	<u>-118,719</u>	<u>-109,273</u>
Net contribution income	14,176,769	139,193,925
Investment income:		
Interest, dividends and other income	\$3,192,122	\$1,629,339
Recognition of capital appreciation	4,866,258	4,523,531
Less investment fees	<u>-346,896</u>	<u>-154,454</u>
Net investment income	<u>7,711,484</u>	<u>5,998,416</u>
Total income available for benefits	\$21,888,253	\$145,192,341
Less benefit payments	-\$24,437,110	-\$24,325,333
Change in reserve for future benefits	-\$2,548,857	\$120,867,008
Net assets at actuarial value at the end of the year	\$165,080,700	\$167,629,557

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT E

Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended June 30, 2016	Year Ended June 30, 2015
Net assets at market value at the beginning of the year	\$163,625,653	\$50,112,795
Contribution income:		
Income from pension deficit funding bond	\$0	\$122,303,087
Employer contributions	12,100,000	14,768,025
Employee contributions	2,195,488	2,232,086
Less administrative expenses	<u>-118,719</u>	<u>-109,273</u>
Net contribution income	14,176,769	139,193,925
Investment income:		
Interest, dividends and other income	\$3,192,122	\$1,629,339
Asset appreciation	-1,376,414	-2,830,619
Less investment fees	<u>-346,896</u>	<u>-154,454</u>
Net investment income	<u>1,468,812</u>	<u>-1,355,734</u>
Total income available for benefits	\$15,645,581	\$137,838,191
Less benefit payments	-\$24,437,110	-\$24,325,333
Change in reserve for future benefits	-\$8,791,529	\$113,512,858
Net assets at market value at the end of the year	\$154,834,124	\$163,625,653

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT F

Summary Statement of Plan Assets

	Year Ended June 30, 2016	Year Ended June 30, 2015
Cash equivalents	\$3,916,417	\$43,209,796
Accounts receivable:		
Employee Contributions	\$62,715	\$64,007
Due from broker for securities sold	255,618	0
Interest and dividends	20,970	2,068
Pre-paid expenses	<u>14,617</u>	<u>14,617</u>
Total accounts receivable	353,920	80,692
Investments:		
Mutual funds	\$95,473,035	\$74,586,052
Common stock	29,529,425	55,021,123
Municipal bonds	<u>25,681,508</u>	<u>8,104,142</u>
Total investments at market value	<u>150,683,968</u>	<u>137,711,317</u>
Total assets	\$154,954,305	\$181,001,805
Less accounts payable:		
Accounts payable and accrued expenses	-\$120,181	-\$65,189
Due to Broker for securities purchased	0	-17,310,963
Total accounts payable	-\$120,181	-\$17,376,152
Net assets at market value	<u>\$154,834,124</u>	<u>\$163,625,653</u>
Net assets at actuarial value	<u>\$165,080,700</u>	<u>\$167,629,557</u>

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT G

Development of the Fund Through June 30, 2016

Year Ended June 30	Employer Contributions	Employee Contributions	Net Investment Return*	Administrative Expenses	Benefit Payments	Actuarial Value of Assets at End of Year
2007	\$9,000,000	\$1,742,369	\$7,520,911	\$83,441	\$16,883,475	\$84,069,349
2008	12,000,000	1,845,471	5,387,042	110,134	17,359,201	85,832,527
2009	12,500,000	1,983,963	-3,223,225	106,880	18,101,394	78,884,991
2010	12,500,000	1,968,410	6,884,458	100,740	18,784,600	81,352,519
2011	6,550,000	2,053,140	3,232,260	113,089	19,762,293	73,312,537
2012	3,040,000	2,138,782	1,040,920	103,868	20,586,244	58,842,127
2013	9,340,000	2,153,222	1,935,758	101,595	22,346,744	49,822,768
2014	12,500,000	2,181,831	5,916,442	76,352	23,582,140	46,762,549
2015	137,071,112**	2,232,086	5,998,416	109,273	24,325,333	167,629,557
2016	12,100,000	2,195,488	7,711,484	118,719	24,437,110	165,080,700

* Net of investment fees; includes the effect of the asset method changes for years ending in 2007 and 2010.

** The employer contributions for the year ended June 30, 2015 include \$122,303,087 in funds from a pension deficit funding bond issue.

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT H

Development of Unfunded Actuarial Accrued Liability for Year Ended June 30, 2016

1. Unfunded actuarial accrued liability at beginning of year		\$286,810,384
2. Normal cost at beginning of year		5,603,110
3. Total contributions		-14,295,488
4. Interest		
(a) For whole year on (1) + (2)	\$20,468,945	
(b) For half year on (3)	<u>-530,828</u>	
(c) Total interest		<u>19,938,117</u>
5. Expected unfunded actuarial accrued liability		\$298,056,123
6. Changes due to:		
(a) Net experience gains and losses	\$5,057,039	
(b) Assumptions	<u>-26,672,204</u>	
(e) Total changes		<u>-21,615,165</u>
7. Unfunded actuarial accrued liability at end of year		<u>\$276,440,957</u>

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT I

Definitions of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Assumptions or Actuarial Assumptions:

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Withdrawal rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

Normal Cost:

The amount of contributions required to fund the benefit allocated to the current year of service.

Actuarial Accrued Liability For Actives:

The value of all projected benefit payments for current members less the portion that will be paid by future normal costs.

Actuarial Accrued Liability For Pensioners:

The single-sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

Unfunded Actuarial Accrued Liability:

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There is a wide range of approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

SECTION 3: Supplemental Information for the Employees Retirement Plan of the Town of Hamden

Amortization of the Unfunded

Actuarial Accrued Liability: Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

Investment Return:

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT I

Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1. Retired participants as of the valuation date (including 113 beneficiaries in pay status)		722
2. Participants inactive during year ended June 30, 2016 with vested rights		24
3. Participants active during the year ended June 30, 2016		408
Fully vested	349	
Partially vested	46	
Not vested	13	

The actuarial factors as of the valuation date are as follows:

1. Normal cost, including administrative expenses		\$4,997,866
2. Present value of future benefits		472,893,967
3. Present value of future normal costs		31,372,310
4. Actuarial accrued liability		441,521,657
Retired participants and beneficiaries	\$293,279,299	
Inactive participants with vested rights	2,507,903	
Active participants	145,734,455	
5. Actuarial value of assets (\$154,834,124 at market value as reported by Buckley, Frame, Boudreau & Co., P.C.)		165,080,700
6. Unfunded actuarial accrued liability		\$276,440,957

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT I (continued)

Summary of Actuarial Valuation Results

The determination of the recommended contribution is as follows:

1. Total normal cost	\$4,882,866
2. Administrative expenses	115,000
3. Expected employee contributions	<u>-2,143,370</u>
4. Employer normal cost: (1) + (2) + (3)	\$2,854,496
5. Payment on unfunded actuarial accrued liability	17,500,332
6. Town's recommended contribution at beginning of year: (4) + (5)	<u>\$20,354,828</u>
7. Town's recommended contribution for fiscal year ending June 30, 2017, payable at mid-year: (6) x 1.035	\$21,067,247

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT II

History of Employer Contributions

Plan Year Ended June 30	Actuarially Determined Employer Contributions (ADEC)*	Actual Contributions	Percentage Contributed
2008	\$16,754,259	\$12,000,000	71.6%
2009	18,292,235	12,500,000	68.3%
2010	18,911,433	12,500,000	66.1%
2011	19,088,623	6,550,000	34.3%
2012	19,850,851	3,040,000	15.3%
2013	27,145,128	9,340,000	34.4%
2014	27,688,031	12,500,000	45.1%
2015	29,536,050	14,768,025**	50.0%
2016	21,998,113	12,100,000	55.0%
2017	21,067,247	--	--

**Prior to 2014, this amount was the GASB Annual Required Contribution (ARC)*

*** The contributions shown for the year ended June 30, 2015 exclude \$122,303,087 in funds from a pension deficit funding bond issue.*

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT III

Schedule of Funding Progress

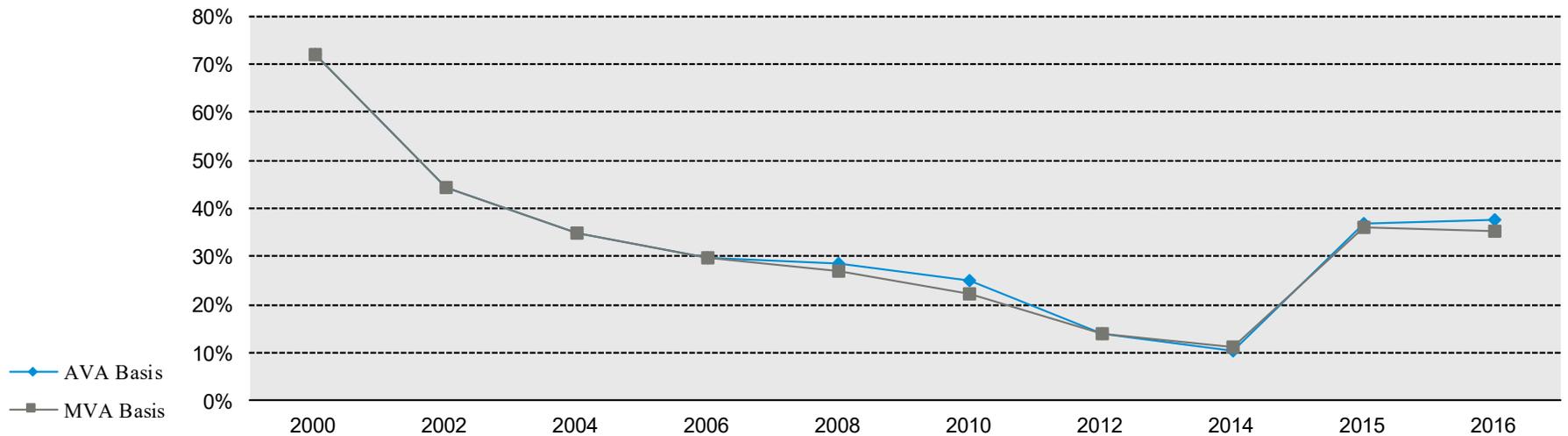
Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)
07/01/2004	\$83,785,549	\$239,835,010	\$156,049,461	34.93%	\$30,840,944	505.98%
07/01/2006	82,718,403	278,857,512	196,139,109	29.66%	30,598,423	641.01%
07/01/2008	85,832,527	303,003,978	217,171,451	28.33%	33,976,398	639.18%
07/01/2010	81,352,519	323,748,595	242,396,076	25.13%	33,051,700	733.38%
07/01/2012	58,842,127	419,266,994	360,424,867	14.03%	31,241,635	1,153.67%
07/01/2014	46,762,549	452,501,230	405,738,681	10.33%	29,347,110	1,382.55%
07/01/2015	167,629,557	454,439,941	286,810,384	36.89%	28,992,189	989.27%
07/01/2016	165,080,700	441,521,657	276,440,957	37.39%	28,397,008	973.49%

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

**EXHIBIT IV
Funded Ratio**

A critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the Plan as calculated. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

The chart below depicts a history of the funded ratios for this plan, on both an actuarial value (AVA) basis and a market value (MVA) basis. There was a significant decline in the 2000s due to investment losses and Town contributions that were less than the GASB annual required contributions. The addition of \$122.3 million in assets from pension deficit funding bonds in March 2015 has improved the funded ratio, and it should continue to improve if the Town makes the annual recommended contributions in the future.



SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT V

Actuarial Assumptions and Actuarial Cost Method

Rationale for Demographic Assumptions:

Current data is reviewed in conjunction with each annual valuation. Based on professional judgment, past experience and future expectations, the following assumptions were changed:

- Mortality, previously RP-2000 projected 19 years with Scale BB
 - Cost-of-living increases, previously 3.00% per year
 - Administrative expenses, previously \$100,000 per year
-

Mortality Rates:

Healthy

RP-2000 Combined Healthy Mortality Table, projected 24 years with Scale BB

Disabled

RP-2000 Disabled Retiree Table, projected 24 years with Scale BB

The RP-2000 mortality tables, projected to the 2016 valuation date, reasonably reflect the projected mortality experience of the Plan as of the measurement date. The additional projection of eight years is a provision made for future mortality improvement.

The mortality rates were based on historical and current demographic data, adjusted to reflect estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of deaths and the projected number based on the prior years' assumption over the most recent three years. (This assumption was updated in 2016.)

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

Termination Rates before Retirement:

Age	Rate (%) for Service Employees			
	Mortality		Disability*	Withdrawal
	Male	Female	All Lives	All Lives
20	0.03	0.02	0.06	16.32
25	0.04	0.02	0.09	14.68
30	0.04	0.02	0.11	11.11
35	0.07	0.04	0.15	7.05
40	0.10	0.07	0.22	3.38
45	0.14	0.11	0.36	0.80
50	0.20	0.16	0.61	0.00
55	0.34	0.25	1.01	0.00
60	0.59	0.42	1.63	0.00

**25% of disabilities are assumed to be service-related.*

Age	Rate (%) for Guardian Employees			
	Mortality		Disability*	Withdrawal
	Male	Female	All Lives	All Lives
20	0.03	0.02	0.12	5.44
25	0.04	0.02	0.17	4.89
30	0.04	0.02	0.22	3.70
35	0.07	0.04	0.29	2.35
40	0.10	0.07	0.44	1.13
45	0.14	0.11	0.72	0.27
50	0.20	0.16	1.21	0.00
55	0.34	0.25	2.02	0.00
60	0.59	0.42	3.25	0.00

**75% of disabilities are assumed to be service-related.*

The termination and disability rates were based on historical and current demographic data, adjusted to reflect estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of terminations and disability retirements and the projected number based on the prior years' assumption over the most recent three years. (The disability assumption was updated in 2012.)

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

Retirement Rates:	<u>Service Employees</u>		<u>Guardian Employees</u>	
	Age	Retirement Probability (%)	Age	Retirement Probability (%)
	55-61	5.00	60-64	25.00
	62-64	15.00	65	100.00
	65	75.00	<i>*10% added at the first eligibility for 20 years of service, until age 60.</i>	
	66-69	50.00		
	70	100.00		
	<i>*20% added at the first eligibility for 30 years of service.</i>			

The retirement rates were based on historical and current demographic data, adjusted to reflect estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of retirements by age and the projected number based on the prior years' assumption over the most recent three years. (The retirement assumption was updated in 2012.)

Retirement Age for Inactive Vested Participants:

Age 62

The retirement age for inactive vested participants was based on historical and current demographic data, adjusted to reflect estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of retirements and the projected number based on the prior years' assumption over the most recent three years.

Unknown Data for Participants:

Same as those exhibited by Participants with similar known characteristics. If not specified, Participants are assumed to be male.

Percent Married:

80% of males and 60% of females

Age of Spouse:

Females three years younger than males

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

Net Investment Return:	7.00%	The net investment return assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment. As part of the analysis, a building block approach was used that reflects inflation expectations and anticipated risk premiums for each of the portfolio's asset classes, as well as the Plan's target asset allocation.
Salary Increases:	2.50%	The salary scale assumption was set based on a review of collective bargaining agreements for the employees and input from the Town's Finance Department.
Interest on Employee Contributions:	5.00%	
Cost-of-Living Increases:	2.25%	
Operating Expenses:	\$115,000	
Actuarial Value of Assets:		Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual and expected market returns, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.
Actuarial Cost Method:		Entry Age Normal Actuarial Cost Method. Entry Age is the age at the time the participant commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by compensation.
Changes in Assumptions:		Based on past experience and future expectations, the following actuarial assumptions were changed: <ul style="list-style-type: none">➤ The assumed Cost of Living increases were lowered from 3.00% per year to 2.25% per year.➤ The static projection of Scale BB was lengthened by 5 years, from 19 years to 24 years, on the RP-2000 mortality table.➤ Assumed administrative expenses were increased from \$100,000 per year to \$115,000 per year.

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT VI

Summary of Plan Provisions

This exhibit summarizes the major provisions of the Retirement Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year	July 1 through June 30
Plan Status	Closed to new entrants
Eligibility	Employee of the Town of Hamden and classified as either a “Service” or “Guardian” employee. Participants must make the mandatory employee contributions and be regularly scheduled to work more than 20 hours per week. Participation in the Plan closed to Guardian employees on July 1, 2006 and to all other employees on July 1, 2007.

Normal Pension – Guardians

<i>Age and service requirements</i>	The earlier of age 60 or the completion of 20 years of Credited Service
<i>Amount</i>	2.5% of Average Annual Compensation per year of Credited Service for the first 20 years, plus 3% of Average Annual Compensation per year for Credited Service for the next 5 years, plus 2% of Average Annual Compensation per year of Credited Service in excess of 25 years to a maximum of 35 years. Effective July 1, 2006, no Employee shall receive more than 80% based on the above formula. Prior to June 30, 2006, a participant can receive more than 80% if they have the required years of service and were hired before July 1, 1981. Such participant’s benefits shall be frozen as of June 30, 2006. For Employees hired after July 1, 1981, the maximum years of Credited Service is 35. Average Annual Compensation is defined as the most recent twelve consecutive month period immediately prior to termination or, if greater, the highest one plan year of annual compensation including regular base salary, longevity payments, holiday pay and workers’ compensation payment. A participant's minimum retirement benefit shall not be less than sixty-hundredths (60/100) of one percent (1%) of Average Annual Compensation per year of Credited Service or \$3.25 per year of Credited Service whichever is greater.

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

Early Retirement – Guardians

<i>Age requirement</i>	Within 5 years of the Employee's Normal Retirement Date
<i>Service requirement</i>	15 years of Credited Service
<i>Amount</i>	Normal pension accrued, unreduced for early retirement.

Non-Service Connected Disability Retirement – Guardians

<i>Age requirement</i>	None
<i>Service requirement</i>	10 years of Credited Service
<i>Amount</i>	The greater of (a) 30% of Average Annual Compensation if hired on or after July 1, 1981 (25% of Average Annual Compensation if hired on or after July 1, 1987); or (b) Normal pension accrued. Employees hired prior to July 1, 1981 have a minimum benefit of 50% of Average Annual Compensation.

Service Connected Disability Retirement – Guardians

<i>Age and service requirements</i>	None
<i>Amount</i>	The greater of (a) 50% of Average Annual Compensation; or (b) Normal pension accrued.

Vesting – Guardians

<i>Age requirement</i>	None
<i>Service requirement</i>	50% with 10 years of Credited Service, increasing 10% per year of Credited Service to 100% with 15 years of Credited Service.
<i>Amount</i>	Normal pension accrued, multiplied by vested percentage, payable at Normal Retirement Date or if earlier, the first full month following the month the Participant would have completed 20 years of Credited Service. If a member elects a refund of his Employee Contributions, he forfeits his right to his vested benefit.

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

Pre-Retirement Death Benefits – Guardians

<i>Status</i>	Active member at the time of death
<i>Age and service requirements</i>	None
<i>Service requirement</i>	None
<i>Survivor's benefit</i>	Greater of (a) 50% of Average Annual Compensation at death; or (b) 50% of the benefit the Employee would have received had he retired the day before his death payable to spouse until death or remarriage
<i>Surviving children's benefit</i>	25% of Average Annual Compensation payable to dependent children up to age 18
<i>Lump sum death benefit</i>	\$5,000 payable to spouse or dependent children if the Employee's death is service related and if death occurs within one year of the date of injury
<i>Burial allowance</i>	\$5,000

Post-Retirement Death Benefits – Guardians

<i>Survivors' benefit</i>	50% of the benefit that the retiree was receiving at the time of death
<i>Lump sum death benefit</i>	Same as the pre-retirement lump sum death benefit
<i>Burial allowance</i>	\$5,000

Cost of Living Increase – Guardians

Based on changes in the Consumer Price Index, with a maximum of 3%, paid on each May 1 for those Employees who retired prior to January 1. Participants with pension start dates of December 1, 1982 or earlier receive 3% regardless of the Consumer Price Index.

Employee Contributions – Guardians

8.50% of Annual Compensation. Interest accrues at 5.00% per year.

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

Normal Retirement – Service Employees

<i>Age and service requirements</i>	The earlier of age 65, the completion of 30 years of Credited Service; or age 55 and completion of 20 years of Credited Service.
<i>Amount</i>	2.5% of Average Annual Compensation per year of Credited Service for the first 20 years plus 2.0% of the Average Annual Compensation in excess of 20, to a maximum of 35 years, not to exceed 85% of Average Annual compensation for Employees hired after July 1, 1978. For members hired prior to July 1, 1978, the maximum pension amount may exceed 85% of Average Annual Compensation, but shall be frozen as of June 30, 2008. Average Annual Compensation is defined as the average of Compensation earned during the most recent 24-month period immediately prior to termination or if greater, the average of the highest two consecutive Plan Years of annual Compensation paid to the member out of the last 10 years. Average Annual Compensation includes regular base salary, longevity payments, and any Workers' Compensation payments. A participant's minimum retirement benefit shall not be less than sixty-hundredths (60/100) of one percent (1%) of Average Annual Compensation per year of Credited Service or \$3.25 per year of Credited Service whichever is greater.

Early Retirement – Service Employees

<i>Age requirement</i>	55
<i>Service requirement</i>	10 years
<i>Amount</i>	Normal pension accrued, reduced by .60% per month for the first 5 years preceding age 65 and .30% per month for the next 5 years.

Disability Retirement – Service Employees

<i>Age requirement</i>	None
<i>Service requirement</i>	For a non-service connected Disability pension, 15 years of Credited Service (10 years of Credited Service for Employees hired prior to July 1, 1991). For a service connected Disability pension, there is no service requirement.
<i>Amount</i>	The greater of (a) 50% Average Annual Compensation; or (b) the member's normal retirement pension.

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

Vesting – Service Employees

<i>Age requirement</i>	None
<i>Service requirement</i>	10 years of Credited Service
<i>Amount</i>	Normal pension accrued, payable at Normal Retirement Date If a member elects a refund of his/her Employee Contributions, he/she forfeits his/her vested benefit

Pre-Retirement Death Benefits – Service Employees

<i>Status</i>	Active member at the time of death
<i>Service requirement</i>	5 years of Credited Service
<i>Survivor's benefit</i>	The greater of (a) 50% of Average Annual Compensation at death; or (b) 50% of the benefit the Employee would have received had he retired the day before his death payable to spouse until death or remarriage
<i>Surviving children's benefit</i>	25% benefit payable to dependent children up to age 18
<i>Lump sum death benefit</i>	\$5,000 payable to spouse or dependent children if the Employee's death is service related
<i>Burial allowance</i>	\$5,000

Post-Retirement Death Benefits – Service Employees

<i>Survivor's benefit</i>	The surviving spouse of a member who retires on or after July 1, 1991 is entitled to 50% of the annual retirement benefit that the retiree was receiving at the time of death payable to spouse until death or remarriage
<i>Lump sum death benefit</i>	Same as the pre-retirement lump sum death benefit except must die within one year of termination of employment
<i>Burial allowance</i>	\$5,000

SECTION 4: Reporting Information for the Employees Retirement Plan of the Town of Hamden

**Cost of Living Increase –
Service Employees**

Based on changes in the Consumer Price Index, with a maximum of 3%, paid on each May 1 for those Employees who retired prior to January 1. Participants with pension start dates of December 1, 1982 or earlier receive 3% regardless of the Consumer Price Index.

**Employee Contributions –
Service Employees**

8.00% of Annual Compensation. Interest accrues at 5.00% per year.

Changes in Plan Provisions:

There have been no changes in plan provisions since the last valuation.

SECTION 5: GASB Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT 1

General Information – “Financial Statements”, Note Disclosures and Required Supplementary Information for a Single Employer Pension Plan

Employees covered by benefit terms:

At June 30, 2016, pension plan membership consisted of the following:

Inactive employees or beneficiaries currently receiving benefits	722
Inactive employees entitled to but not yet receiving benefits	24
Active employees	<u>408</u>
Total	1,154

The Retirement Plan is closed to new entrants.

Contributions: Town contributions are assumed to be made in accordance with Section 219 of Public Act 14-217, specifically 70% of the actuarially determined contribution for the fiscal year ending June 30, 2017, 80% of the actuarially determined contribution for the fiscal year ending June 30, 2018, and 100% of the actuarially determined contribution thereafter. Guardian employees contribute 8.50% of annual compensation, and Service employees contribute 8.00.

Benefits provided: See Section 4, Exhibit VI for a summary of plan provisions.

SECTION 5: GASB Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT 2

Net Pension Liability

The components of the net pension liability of the Retirement Plan at June 30, 2016 were as follows:

Total pension liability	\$441,521,657
Plan fiduciary net position	<u>154,834,124</u>
Employer's net pension liability	\$286,687,533
Plan fiduciary net position as a percentage of the total pension liability	35.07%

Actuarial assumptions. The total pension liability was determined by an actuarial valuation as of June 30, 2016, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.25%
Salary increases	2.50%
Investment rate of return	7.00%, net of pension plan investment expense, including inflation
Cost-of-Living Adjustments	2.25%

Healthy mortality rates were based on the sex-distinct RP-2000 Combined Healthy Mortality Table, projected 24 years with Scale BB. Disabled mortality rates were based on the sex-distinct RP-2000 Disabled Retiree Mortality Table, projected 24 years with Scale BB.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding

SECTION 5: GASB Information for the Employees Retirement Plan of the Town of Hamden

expected inflation. Best estimates of real rates of return for each major asset class included in the pension plan’s target asset allocation as of June 30, 2016 are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Domestic Equity	30%	6.75%
International Equity	10%	7.45%
Fixed Income	40%	1.75%
Global Tactical Asset Allocation	10%	3.75%
Real Estate	<u>10%</u>	4.55%
Total	100%	

* Real rates of return are net of inflation

Discount rate: The blended discount rate used to measure the total pension liability is 7.00%. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current negotiated contribution rates: 8.50% of annual compensation for Guardians, and 8.00% of annual compensation for Service employees. Town contributions are assumed to be made in accordance with Section 219 of Public Act 14-217, specifically 70% of the actuarially determined contribution for the fiscal year ending June 30, 2017, 80% of the actuarially determined contribution for the fiscal year ending June 30, 2018, and 100% of the actuarially determined contribution thereafter. The actuarially determined contribution is equal to the total normal cost plus a 30-year closed amortization of the unfunded actuarial accrued liability, beginning July 1, 2014 (28 years remaining). Amortization payments are expected to grow by 2% annually. Based on these assumptions, the Retirement Plan’s fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. The long-term expected rate of return on Retirement Plan investments was applied to the projected benefit payments.

SECTION 5: GASB Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT 3

Changes in Net Pension Liability and Sensitivity to Discount Rate

A. Changes in the Net Pension Liability

	Total Pension Liability (TPL) (a)	Fiduciary Net Position (FNP) (b)	Net Pension Liability (NPL) (a) - (b)
Balances at June 30, 2015	\$454,439,941	\$163,625,653	\$290,814,288
Changes for the year:			
Service cost	\$5,888,328	--	\$5,888,328
Interest	30,955,497	--	30,955,497
Change of benefit terms	--	--	--
Change of assumptions	-26,672,204	--	-26,672,204
Differences between expected and actual experience	1,347,205	--	1,347,205
Contributions – employer	--	\$12,100,000	-12,100,000
Contributions – employee	--	2,195,488	-2,195,488
Net investment income	--	1,468,812	-1,468,812
Benefit payments, including refunds of employee contributions	-24,437,110	-24,437,110	--
Administrative expense	--	<u>-118,719</u>	<u>118,719</u>
Net changes	-\$12,918,284	-\$8,791,529	-\$4,126,755
Balances at June 30, 2016	<u>\$441,521,657</u>	<u>\$154,834,124</u>	<u>\$286,687,533</u>

B. Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability of the Retirement Plan, calculated using the discount rate of 7.00%, as well as what the Plan's net pension liability would be if it were calculated using a discount rate that is one percentage-point lower (6.00%) or one percentage-point higher (8.00%) than the current rate:

1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
\$340,008,912	\$286,687,533	\$242,283,412

SECTION 5: GASB Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT 4

Pension Expense and Deferred Outflows/Inflows of Resources Related to Pensions

A. Pension expense for the year ended June 30, 2016

Service cost	\$5,888,328	
Interest on TPL	30,955,497	
Employee contributions	-2,195,488	
Administrative expenses	118,719	
Expected return on assets	-11,094,684	
Expensed portion of current year period differences between expected and actual experience in TPL	449,069	
Expensed portion of current year period assumption changes	-8,890,736	
Current year plan changes	--	
Expensed portion of current year period differences between projected and actual investment earnings	1,925,176	
Current year recognition of deferred inflows and outflows established in prior years	-2,155,392	
Total expense		\$15,000,489

B. Deferred outflows/inflows of resources related to pensions

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$898,136	-\$3,589,749
Net difference between projected and actual earnings on pension plan investments	12,003,767	--
Assumption changes	--	-17,781,468
Total	\$12,901,903	-\$21,371,217

SECTION 5: GASB Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT 4 (continued)

Pension Expense and Deferred Outflows/Inflows of Resources Related to Pensions

Projected recognition of deferred outflows/(inflows)

	Year Established	Initial Balance	Amount Recognized During FYE June 30, 2016	Outstanding Balance at June 30, 2016	Deferred Outflows/(Inflows) Recognized in Future Years			
					FYE June 30, 2017	FYE June 30, 2018	FYE June 30, 2019	FYE June 30, 2020
Fiscal Year Outflows								
Investment loss	2015	\$7,171,787	\$1,434,357	\$4,303,071	\$1,434,357	\$1,434,357	\$1,434,357	--
Liability loss	2016	1,347,205	449,069	898,136	449,068	449,068	--	--
Investment loss	2016	9,625,872	1,925,176	7,700,696	1,925,174	1,925,174	1,925,174	\$1,925,174
Total Outflows			\$3,808,602	\$12,901,903	\$3,808,599	\$3,808,599	\$3,359,531	\$1,925,174
Fiscal Year Inflows								
Liability gain	2015	-10,769,246	-3,589,749	-3,589,749	-3,589,749	--	--	--
Assumption change	2016	-26,672,204	-8,890,736	-17,781,468	-8,890,734	-8,890,734	--	--
Total Inflows			-12,480,485	-21,371,217	-12,480,483	-8,890,734	--	--
Total			-8,671,883	-8,469,314	-8,671,885	-5,082,135	\$3,359,531	\$1,925,174

Note: In accordance with Paragraph 71 of GASB Statement 68, the difference between projected and actual earnings on investments is recognized over a closed five-year period. Assumption changes and the difference between expected and actual total pension liability experience are each recognized over a closed period equal to the average of the expected remaining service lives of all employees that are provided with pensions through the pension plan (active employees and inactive employees), determined as of the beginning of the measurement period. For 2016, the period is three years (rounded).

SECTION 5: GASB Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT 5

Schedule of Changes in Retirement Plan Net Pension Liability

	2016	2015	2014	2013	2012
Total pension liability					
Service cost	\$5,888,328	\$6,209,591	\$6,238,891		
Interest	30,955,497	30,823,699	31,148,927		
Change of benefit terms	0	0	0		
Differences between expected and actual experience	1,347,205	-10,769,246	5,302,529		
Changes of assumptions	-26,672,204	0	0		
Benefit payments, including refunds of employee contributions	<u>-24,437,110</u>	<u>-24,325,333</u>	<u>-23,582,140</u>		
Net change in total pension liability	<u>-\$12,918,284</u>	<u>\$1,938,711</u>	<u>\$19,108,207</u>		
Total pension liability – beginning	<u>454,439,941</u>	<u>452,501,230</u>	<u>433,393,023</u>		
Total pension liability – ending (a)	<u>\$441,521,657</u>	<u>\$454,439,941</u>	<u>\$452,501,230</u>		
Plan fiduciary net position					
Contributions – employer	\$12,100,000	\$137,071,112	\$12,500,000		
Contributions – employee	2,195,488	2,232,086	2,181,831		
Net investment income	1,468,812	-1,355,734	6,996,801		
Benefit payments, including refunds of employee contributions	-24,437,110	-24,325,333	-23,582,140		
Administrative expense	<u>-118,719</u>	<u>-109,273</u>	<u>-76,352</u>		
Net change in plan fiduciary net position	<u>-\$8,791,529</u>	<u>\$113,512,858</u>	<u>-\$1,979,860</u>		
Plan fiduciary net position – beginning	<u>163,625,653</u>	<u>50,112,795</u>	<u>52,092,655</u>		
Plan fiduciary net position – ending (b)	<u>\$154,834,124</u>	<u>\$163,625,653</u>	<u>\$50,112,795</u>		
Employer’s net pension liability – ending (a) – (b)	<u>\$286,687,533</u>	<u>\$290,814,288</u>	<u>\$402,388,435</u>		
Plan fiduciary net position as a percentage of the total pension liability	35.07%	36.01%	11.07%		
Covered employee payroll	\$28,397,008	\$28,992,189	\$29,347,110		
Employer’s net pension liability as percentage of covered employee payroll	1,009.57%	1,003.08%	1,371.13%		

Notes to Schedule:

Benefit changes: There have been no changes in benefit provisions since GASB67 implementation.

Change of assumptions: There have been assumption changes since GASB67 implementation as outlined in Section 4, Exhibit V.

Employer contributions: The employer contributions for 2015 include one-time pension deficit bond funding of \$122,303,087.

SECTION 5: GASB Information for the Employees Retirement Plan of the Town of Hamden

EXHIBIT 6

Schedule of Retirement Plan's Contribution

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution	Contribution Deficiency (Excess)	Covered-Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2014	\$27,688,031	\$12,500,000	\$15,188,031	\$29,347,110	42.59%
2015	29,536,050	14,768,025	14,768,025	28,992,189	50.94%
2016	21,998,113	12,100,000	9,898,113	28,397,008	42.61%

** This purpose of this table is to present the trend of employer contributions in relation to the actuarially determined contributions. Therefore, the pension deficit bond funding of \$122,303,087 is excluded from the 2015 contributions.*

Notes to Schedule:

Actuarial determined contributions are calculated using a July valuation date as of the beginning of the fiscal year for which the contributions are reported.

Methods and used assumptions to determine contribution rates used to calculate the actuarially determined contribution for the year ended June 30, 2016:

Actuarial cost method	Entry age normal
Amortization method	Level percent with 2.00% annual increases, closed period
Remaining amortization period	29 years remaining as of July 1, 2015
Asset valuation method	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.
Investment rate of return	7.00%
Inflation rate	3.00%
Projected salary increases	2.50%
Cost of living adjustments	3.00%
Retirement Rates	See Section 4, Exhibit VI for a summary of assumption.
Mortality	Non-disabled: RP-2000 Combined Healthy Mortality Table, projected 19 years with Scale BB Disabled: RP-2000 Combined Healthy Mortality Table, projected 24 years with Scale BB