

# Town of East Hartford Pension Plan

**Actuarial Valuation and Review as of July 1, 2020**



This report has been prepared at the request of the Pension Board to assist in administering the Plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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**Segal**



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April 20, 2021

Mr. Lee Griffin  
Town of East Hartford  
740 Main Street  
East Hartford, CT 06108

Dear Mr. Griffin:


We are pleased to submit this Actuarial Valuation and Review as of July 1, 2020. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal year ending June 30, 2022.

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 and financial information on which our calculations were based was prepared by the Town of East Hartford. That assistance is gratefully acknowledged.

The actuarial calculations were directed under my supervision. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in my opinion, the assumptions as approved by the Pension Board 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

  
\_\_\_\_\_  
Henry P. Nearing, FCA, EA, MAAA  
Vice President and Consulting Actuary

# Table of Contents

## Section 1: Actuarial Valuation Summary

Purpose and basis .....	4
Valuation highlights.....	5
Summary of key valuation results .....	8
Important information about actuarial valuations .....	9

## Section 2: Actuarial Valuation Results

Participant data.....	11
Financial information.....	15
Actuarial experience .....	19
Actuarially determined contribution .....	24
Risk .....	27

## Section 3: Supplemental Information

Exhibit A: Table of Plan Demographics.....	30
Exhibit B: Participants in Active Service as of June 30, 2020 by Age, Years of Benefit Service, and Average Pay .....	31
Exhibit C: Reconciliation of Participant Data .....	32
Exhibit D: Summary Statement of Income and Expenses on a Market Value Basis.....	33
Exhibit E: Development of the Fund through June 30, 2020 .....	34
Exhibit F: Definition of Pension Terms .....	35

## Section 4: Actuarial Valuation Basis

Exhibit I: Actuarial Assumptions, Actuarial Cost Method and Models.....	39
Exhibit II: Summary of Plan Provisions .....	43

# Section 1: Actuarial Valuation Summary

## Purpose and basis

This report was prepared by Segal to present a valuation of the Plan as of July 1, 2020. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. 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; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Plan, as administered by the Town;
- The characteristics of covered active participants, inactive vested participants, and retired participants and beneficiaries as of July 1, 2020, provided by the Town;
- The assets of the Plan as of June 30, 2020, provided by the Town;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions regarding employee terminations, retirement, death, etc.

Certain disclosure information required by GASB Statements No 67 and 68 as of June 30, 2020 for the Plan is provided in a separate report.

## Section 1: Actuarial Valuation Summary

### Valuation highlights

1. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. In the short term, the funding policy adopted by the Town does not meet this standard, as the amortization does not cover the interest on the unfunded liability.
2. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 49.80%, compared to the prior year funded ratio of 51.97%. The main cause of the decline in the funded ratio was the lower than expected return on assets. This ratio is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 45.03%, compared to 49.76% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.
3. The actuarially determined contribution (ADC) for the upcoming year is \$18,964,310, an increase of \$1,455,450 from last year. The contribution as a percentage of payroll increased from 49.02% of payroll to 54.59% of payroll, based on a 23-year amortization of the unfunded actuarial accrued liability. The main causes of this increase were the expected increase in the amortization payment and the lower than expected return on assets. The 2021/2022 ADC is based on the assumed long-term rate of return of 7.50% as selected by the Town.
4. The actuarial loss from investment and other experience is \$13,012,217, or 2.79% of actuarial accrued liability.
5. The rate of return on the market value of assets was -2.13% for the plan year ending June 30, 2020. The return on the actuarial value of assets was 3.29% for the same period due to the recognition of prior years' investment gains and losses. This resulted in an actuarial loss when measured against the assumed rate of return of 7.55%. Given the low fixed income interest rate environment, target asset allocation and expectations of future investment returns for various classes, we advise the Board to continue to monitor actual and anticipated investment returns relative to the assumed long-term rate of return on investments of 7.50%. A rate in the 6.50% to 7.00% range may be more appropriate.
6. If the long-term rate of return on investment assumption was lowered to 6.50% for the current year, the ADC for the upcoming year would be \$22,424,000, an increase of approximately \$3,460,000 over the ADC using a 7.50% interest rate.
7. The actuarial value of assets is 110.60% of the market value of assets. The investment experience in the past years has only been partially recognized in the actuarial value of assets. As the deferred net loss is recognized in future years, the cost of the Plan is likely to increase unless the net loss is offset by future experience. The recognition of the market losses of \$22,311,638 will also have an impact on the future funded ratio. If the net deferred losses were recognized immediately in the actuarial value of assets, the ADC would increase from 54.59% to about 58.93% of payroll.

## Section 1: Actuarial Valuation Summary

8. The following actuarial assumptions were changed with this valuation:

- The net investment return assumption was lowered from 7.55% to 7.50% to better reflect future expectations.
- Mortality for males was projected an additional year using Scale BB. The mortality scale used for females was updated from Scale MP-2018 to MP-2020.
- The interest crediting rate on employee money assumption was lowered from 3.00% per year to 2.50% per year to better reflect future expectations.

As a result of these assumption changes, the total normal cost increased by approximately \$58,000 and the actuarial accrued liability increased by approximately \$1,768,000. The total impact was an increase in the ADC of approximately \$111,000.

9. The following table details the change in plan provisions that will apply for Police employees hired after December 31, 2019. This plan change is included for the first time in this valuation:

Plan Provision	Pre-12/31/2019 Police Employees	Post-12/31/2019 Police Employees
Employee contributions	8.00%	9.00%
Benefit multiplier	2.50%	2.33%
Cost-of-living increase	Varies by retirement date	1% starting in 7 <sup>th</sup> year of retirement
Unused sick and vacation time	Included in final average earnings	Not included in final average earnings

*For a full summary of plan provisions, please see Section 4, Exhibit II*

As a result of this plan change, the total normal cost decreased by approximately \$35,000. The total impact was a decrease in the ADC of approximately \$36,000.

10. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution under the Plan's funding policy and measuring the progress of that funding policy. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68, for inclusion in the plan and employer's financial statements as of June 30, 2020 was provided separately on October 8, 2020.
11. It is important to note that this actuarial valuation is based on plan assets as of June 30, 2020. Due to the COVID-19 pandemic, market conditions have changed significantly since the valuation date. The Plan's actuarial status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year. While it is impossible to determine how the market will perform over the next several months, and how that will affect the results of next year's valuation, Segal is available to prepare projections of potential outcomes upon request.

## Section 1: Actuarial Valuation Summary

12. Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the Plan's future financial condition, but have included a brief discussion of some risks that may affect the Plan in Section 2. A more detailed assessment would provide the Board with a better understanding of the inherent risks.

## Section 1: Actuarial Valuation Summary

### Summary of key valuation results

		2021	2020	2019
<b>Contributions for fiscal year beginning July 1:</b>	<ul style="list-style-type: none"> <li>Actuarially determined contributions</li> <li>Actuarially determined contributions as a percent of pay</li> </ul>	\$18,964,310 54.59%	\$17,508,860 49.02%	\$16,416,732 41.71%
<b>Actuarial accrued liability for plan year beginning July 1:</b>	<ul style="list-style-type: none"> <li>Retired participants and beneficiaries</li> <li>Inactive vested participants</li> <li>Active participants</li> <li>Inactive participants due a refund of employee contributions</li> <li>Total</li> <li>Normal cost including administrative expenses for plan year beginning July 1</li> </ul>		\$323,182,688 3,159,749 140,855,548 <u>237,051</u> \$467,435,036 5,579,727	\$305,795,619 2,669,125 144,911,210 <u>285,444</u> \$453,661,398 5,671,978
<b>Assets for plan year beginning July 1:</b>	<ul style="list-style-type: none"> <li>Market value of assets (MVA)<sup>1</sup></li> <li>Actuarial value of assets (AVA)<sup>1</sup></li> <li>Actuarial value of assets as a percentage of market value of assets</li> </ul>		\$210,489,974 232,801,612 110.60%	\$225,746,327 235,759,401 104.44%
<b>Funded status for plan year beginning July 1:</b>	<ul style="list-style-type: none"> <li>Unfunded/(overfunded) actuarial accrued liability on market value of assets</li> <li>Funded percentage on MVA basis</li> <li>Unfunded/(overfunded) actuarial accrued liability on actuarial value of assets</li> <li>Funded percentage on AVA basis</li> <li>Amortization period</li> </ul>		\$256,945,062 45.03% \$234,633,424 49.80% 23	\$227,915,071 49.76% \$217,901,997 51.97% 24
<b>Key assumptions</b>	<ul style="list-style-type: none"> <li>Net investment return</li> <li>Inflation rate</li> </ul>		7.50% 3.25%	7.55% 3.25%
<b>Demographic data for plan year beginning July 1:</b>	<ul style="list-style-type: none"> <li>Number of retired participants and beneficiaries</li> <li>Number of inactive vested participants</li> <li>Number of active participants</li> <li>Number of inactive participants due a refund of employee contributions</li> <li>Projected total pay</li> <li>Projected average pay</li> </ul>		725 33 428 56 \$33,645,319 78,611	717 31 449 57 \$34,593,008 77,045

<sup>1</sup> Does not include DROP assets. This amount was also excluded from the liabilities. As of July 1, 2020, the DROP account assets are \$8,938,770. As of July 1, 2019, the DROP account assets were \$7,972,961.



## Section 1: Actuarial Valuation Summary

### 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 relies on a number of input items. These include:

<b>Plan of benefits</b>	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.
<b>Participant data</b>	An actuarial valuation for a plan is based on data provided to the actuary by the Town. 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.
<b>Assets</b>	The valuation is based on the market value of assets as of the valuation date, as provided by the Town. 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.
<b>Actuarial assumptions</b>	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: Actuarial Valuation Summary

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. 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.

Actuarial results in this report are not rounded, but that does not imply precision.

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.

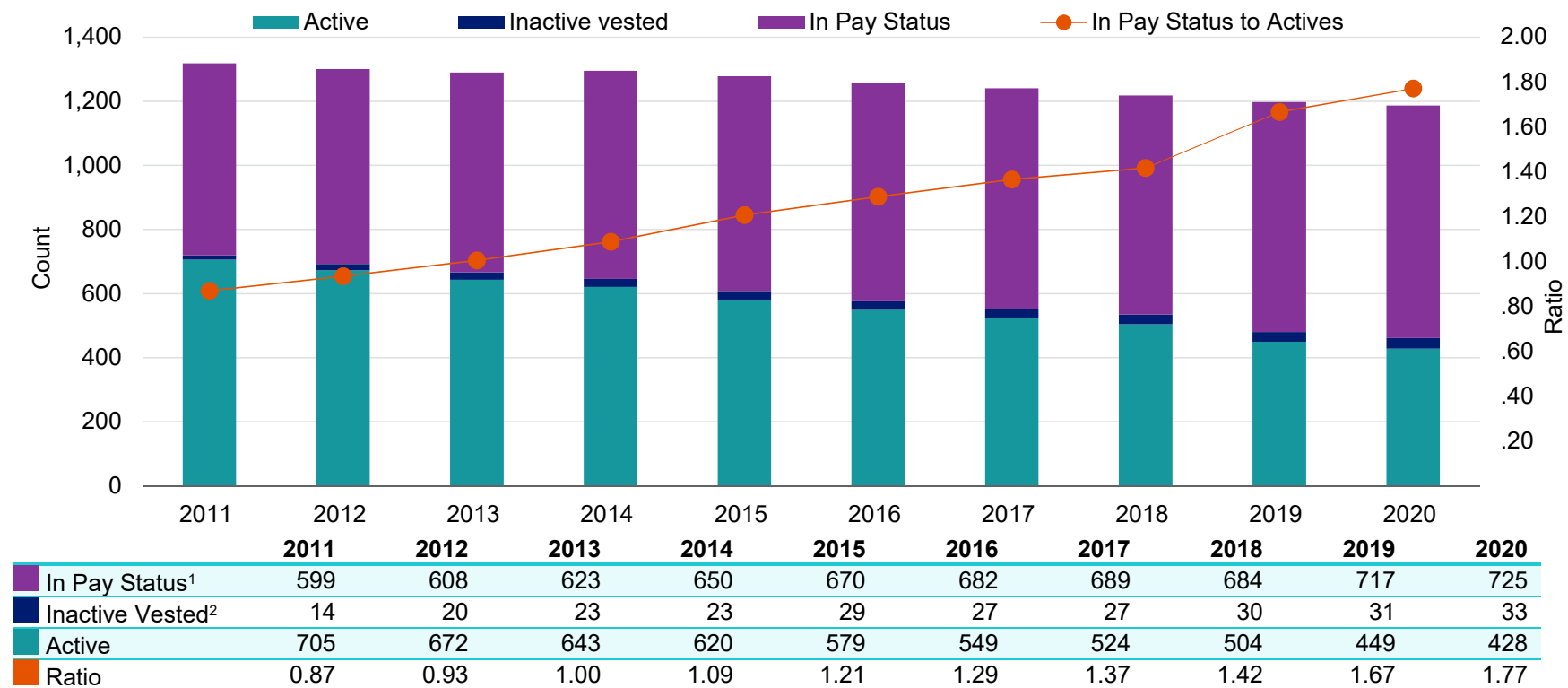
As Segal has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

# Section 2: Actuarial Valuation Results

## Participant data

This section presents a summary of significant statistical data on these participant groups.

Participant Population: 2011 – 2020



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

<sup>1</sup> Includes disabled participants (26 as of June 30, 2020)

<sup>2</sup> Excludes terminated participants due a refund of employee contributions (56 as of June 30, 2020)

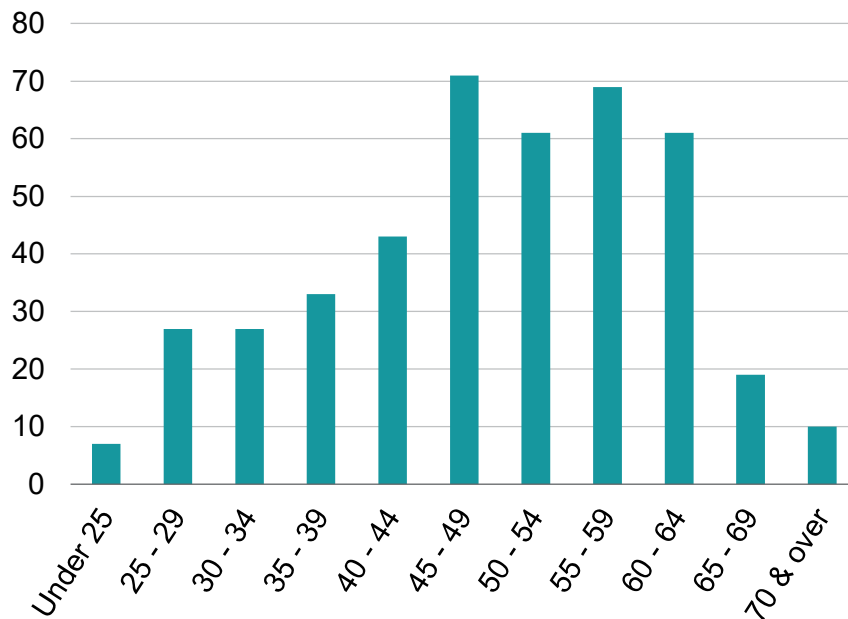
## Section 2: Actuarial Valuation Results

### Active participants

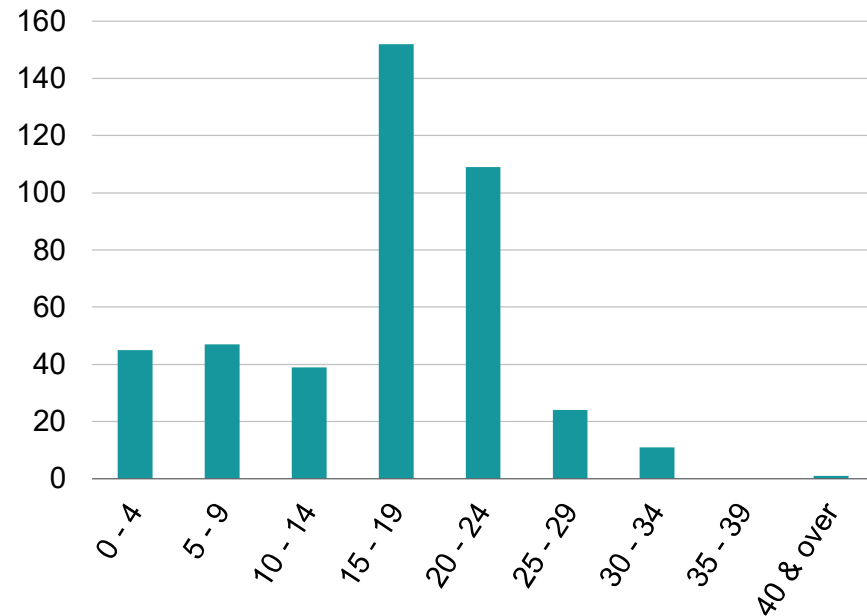
As of June 30,	2020	2019	Change
Active participants	428	449	-4.7%
Average age	49.7	50.1	-0.4
Average years of benefit service	16.1	16.2	-0.1
Average compensation	78,611	77,045	2.0%

Distribution of Active Participants as of June 30, 2020

Actives by Age



Actives by Years of Benefit Service



## Section 2: Actuarial Valuation Results

### **Inactive participants**

In this year's valuation, there were 33 participants with a vested right to a deferred or immediate vested benefit.

In addition, there were 56 participants entitled to a return of their employee contributions who do not have a vested benefit.

## Section 2: Actuarial Valuation Results

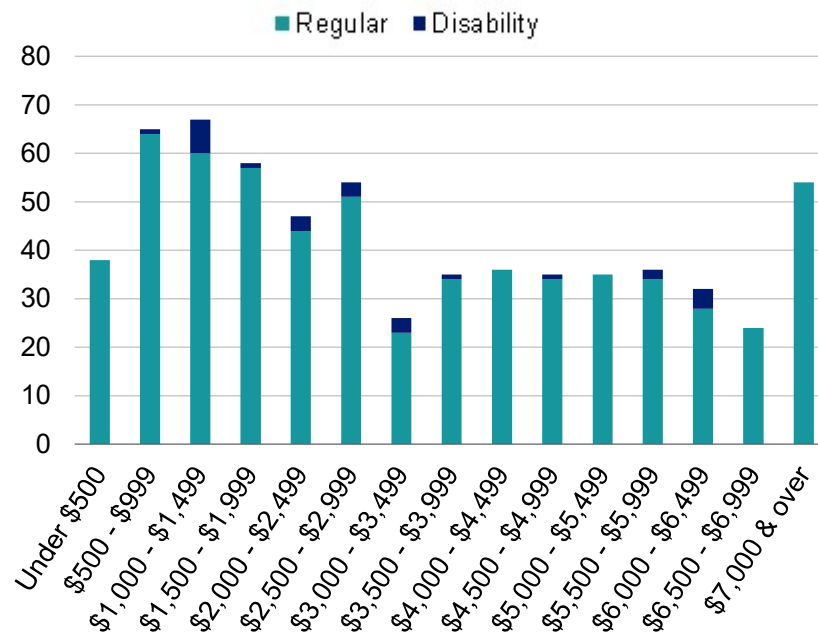
### Retired participants and beneficiaries

As of June 30,	2020	2019	Change
Retirees (including disabled participants)	659	650	1.4%
Beneficiaries	66	67	-1.5%
Average age	70.6	70.8	-0.2
Average amount	\$3,252	\$3,138	3.6%
Total monthly amount	\$2,357,765	\$2,249,762	4.8%

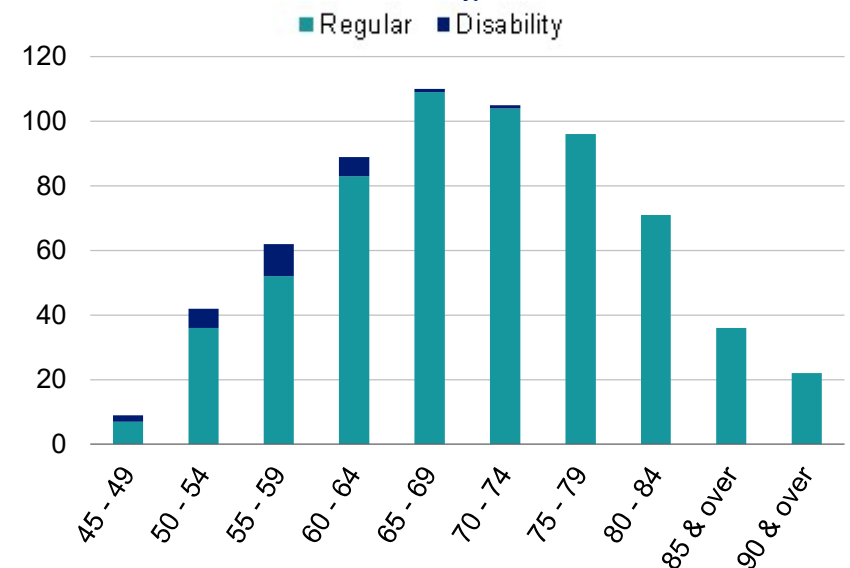
As of June 30,	2020	2019	Change
DROP retirees	36	38	-5.3%
Average age	53.3	52.4	0.9
Average amount	\$6,368	\$6,606	-3.6%

### Distribution of Retired Participants as of June 30, 2020

#### Retired Participants by Type and Monthly Amount



#### Retired Participants by Type and Age



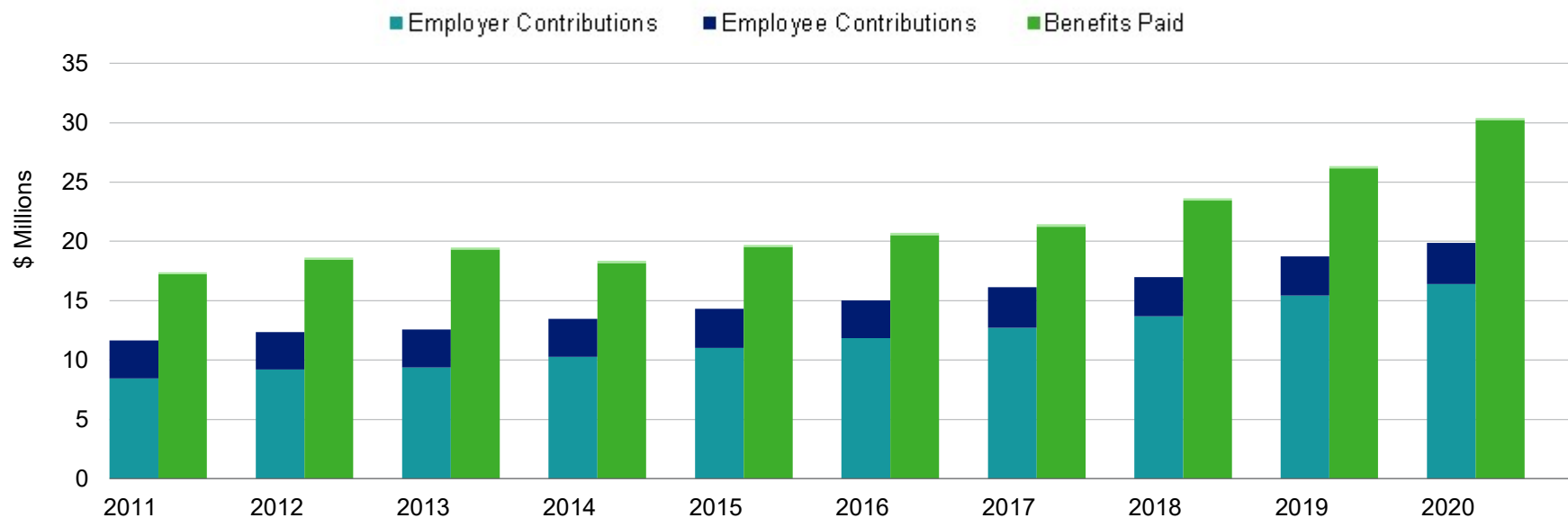
## Section 2: Actuarial Valuation Results

### Financial information

Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and 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 transactions for the valuation year, is presented in *Section 3, Exhibits D and E*.

Comparison of Contributions Made with Benefits Paid  
for Years Ended June 30, 2011 – 2020



## Section 2: Actuarial Valuation Results

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Pension 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.

### Determination of Actuarial Value of Assets for Year Ended June 30, 2020

<b>1</b>	Market value of assets, June 30, 2020			\$210,489,974
<b>2</b>	Calculation of unrecognized return	<b>Original Amount<sup>1</sup></b>	<b>Percent Deferred<sup>2</sup></b>	<b>Unrecognized Amount<sup>3</sup></b>
<b>(a)</b>	Year ended June 30, 2020	(\$21,349,837)	80%	(\$17,079,870)
<b>(b)</b>	Year ended June 30, 2019	(9,876,170)	60%	(5,925,702)
<b>(c)</b>	Year ended June 30, 2018	(957,333)	40%	(382,934)
<b>(d)</b>	Year ended June 30, 2017	5,384,340	20%	1,076,868
<b>(e)</b>	Total unrecognized return			(\$22,311,638)
<b>3</b>	Preliminary actuarial value: <b>(1) - (2e)</b>			232,801,612
<b>4</b>	Adjustment to be within 20% corridor			0
<b>5</b>	Final actuarial value of assets as of June 30, 2020: <b>(3) + (4)</b>			<u>232,801,612</u>
<b>6</b>	Actuarial value as a percentage of market value: <b>(5) ÷ (1)</b>			110.6%
<b>7</b>	Amount deferred for future recognition: <b>(1) - (5)</b>			(\$22,311,638)

<sup>1</sup> Total return minus expected return on a market value basis

<sup>2</sup> Percent deferred applies to the current valuation year

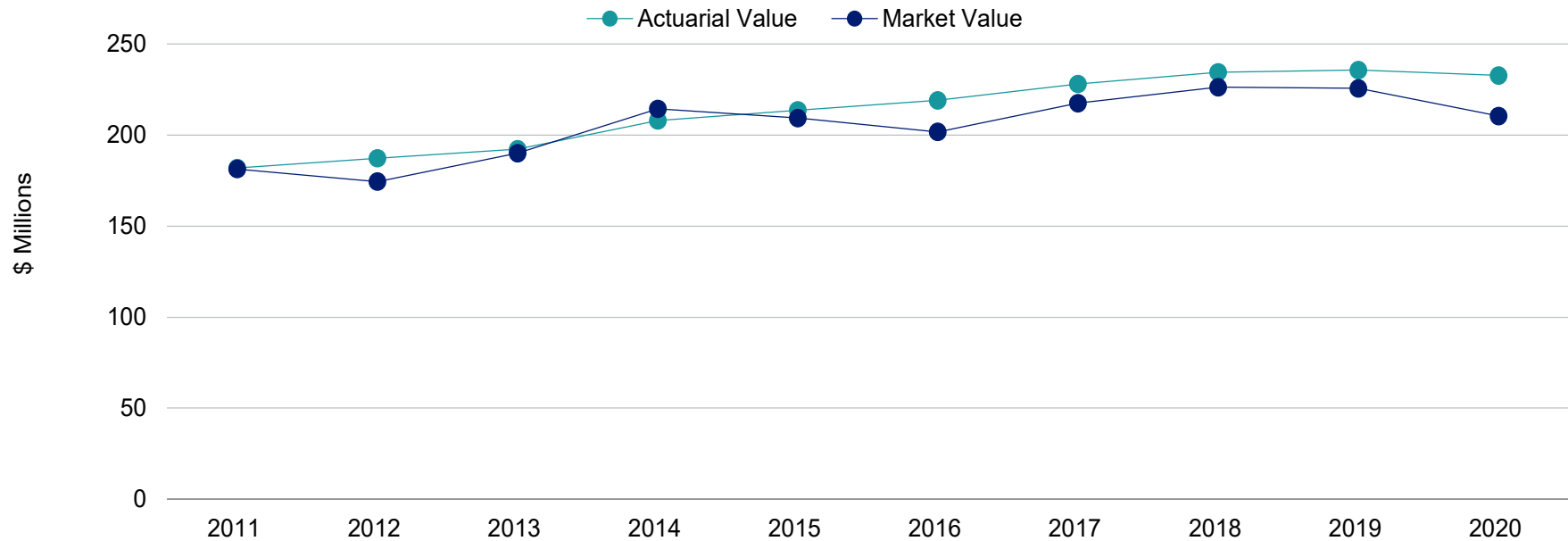
<sup>3</sup> Recognition at 20% per year over five years





## Section 2: Actuarial Valuation Results

Both the actuarial value and market value of assets are representations of the 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 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.

Actuarial Value of Assets vs. Market Value of Assets



		Year Ended June 30									
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	Actuarial Value <sup>1</sup>	\$181.96	\$187.26	\$192.20	\$208.02	\$213.70	\$219.06	\$228.14	\$234.58	\$235.76	\$232.80
	Market Value <sup>1</sup>	181.31	174.50	190.16	214.46	209.40	201.76	217.55	226.33	225.75	210.49

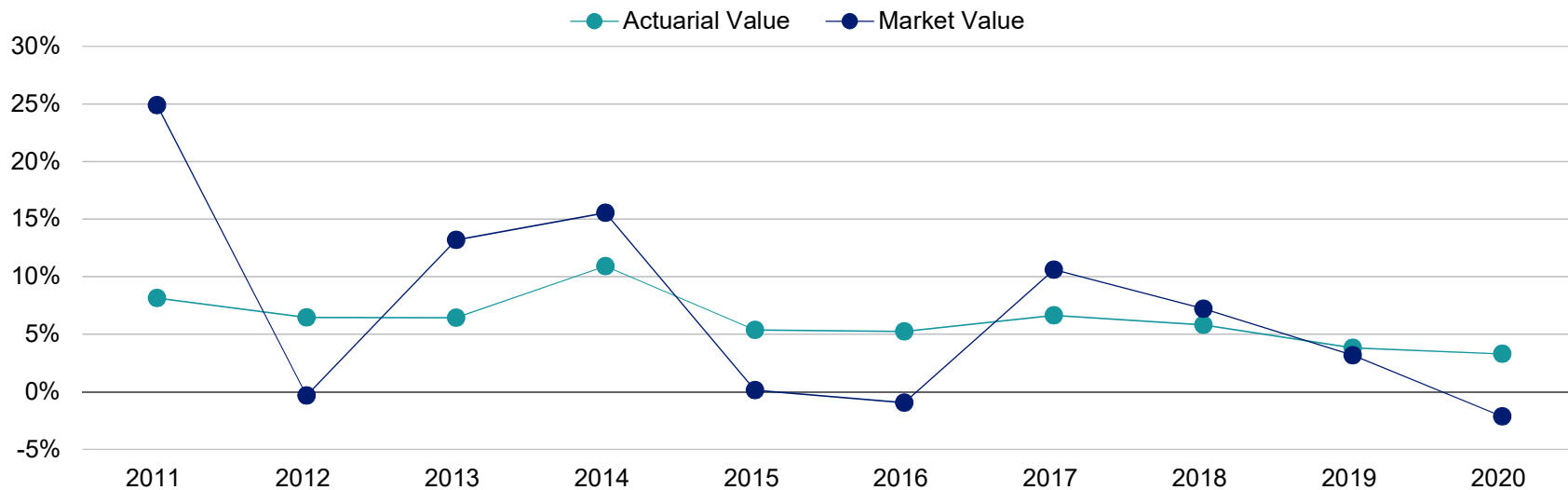
<sup>1</sup> In \$ millions

## Section 2: Actuarial Valuation Results

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 actual market value investment return for the last 10 years, including averages over select time periods.

As described earlier in this section, the actuarial asset valuation method gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

Market and Actuarial Rates of Return for Years Ended June 30, 2011 - 2020



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AVA return <sup>1</sup>	8.16%	6.47%	6.45%	10.91%	5.38%	5.25%	6.65%	5.82%	3.81%	3.29%
MVA return	24.88%	-0.31%	13.20%	15.55%	0.14%	-0.94%	10.60%	7.20%	3.16%	-2.13%
Assumed rate <sup>2</sup>	8.25%	8.25%	8.00%	8.00%	8.00%	8.00%	7.90%	7.65%	7.60%	7.55%

Average Rates of Return	Actuarial Value	Market Value
Most recent five-year average return:	4.94%	3.48%
Most recent ten-year average return:	6.19%	6.39%

<sup>1</sup> Includes effect of change in asset method for years ended June 30, 2013 and June 30, 2014

<sup>2</sup> For fiscal year beginning July 1,

## Section 2: Actuarial Valuation Results

### Actuarial experience

To calculate any actuarially determined 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), any contribution requirement will decrease from the previous year. On the other hand, any 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.

#### Actuarial Experience for Year Ended June 30, 2020

<b>1</b>	Net (loss) from investments <sup>1</sup>	(\$9,807,260)
<b>2</b>	Net gain from administrative expenses	20,201
<b>3</b>	Net (loss) from other experience	<u>(3,225,158)</u>
<b>4</b>	Net experience (loss): <b>1 + 2 + 3</b>	(\$13,012,217)

<sup>1</sup> Details on next page

## Section 2: Actuarial Valuation Results

### Investment experience

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 Plan's investment policy. The rate of return on the market value of assets was -2.13% for the year ended June 30, 2020.

For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.55% based on the prior year's assumption. The actual rate of return on an actuarial basis for the 2020 plan year was 3.29%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended June 30, 2020 with regard to its investments.

#### Investment Experience

		Year Ended June 30, 2020
		Actuarial Value
1	Net investment income	\$7,594,236
2	Average value of assets	230,483,389
3	Rate of return: $1 \div 2$	3.29%
4	Assumed rate of return	7.55%
5	Expected investment income: $2 \times 4$	17,401,496
6	Actuarial gain/(loss): $1 - 5$	(\$9,807,260)

## Section 2: Actuarial Valuation Results

### Non-investment experience

#### Administrative expenses

- Administrative expenses for the year ended June 30, 2020 totaled \$181,217, as compared to the assumption of \$200,000. This resulted in a gain of \$20,201 for the year, including an adjustment for interest. Because it is expected that expenses will remain level, we have maintained the assumption of \$200,000 for the current year

#### 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 participants,
- retirement experience (earlier or later than projected),
- mortality (more or fewer deaths than projected),
- cost-of-living adjustment (higher or lower than projected),
- the number of disability retirements (more or fewer than projected), and
- salary increases (greater or smaller than projected).

The net loss from this other experience for the year ended June 30, 2020 amounted to \$3,225,158, which is 0.7% of the actuarial accrued liability.

## Section 2: Actuarial Valuation Results

### Actuarial assumptions

The assumption changes reflected in this report are:

- The net investment return assumption was lowered from 7.55% to 7.50% as selected by the Town.
- Mortality for males was projected an additional year using Scale BB. The mortality scale used for females was updated from MP-2018 to MP-2020.
- The interest crediting rate on employee money assumption was lowered from 3.00% per year to 2.50% per year to better reflect future expectations.

These changes increased the actuarial accrued liability by approximately \$1,768,000 and increased the normal cost by \$58,000.

Details on actuarial assumptions and methods are in Section 4, Exhibit I.

### Plan provisions

The following table details the plan provisions that are changing for Police employees hired after December 31, 2019. This plan change is included for the first time in this valuation

Plan Provision	Pre-12/31/2019 Police Employees	Post-12/31/2019 Police Employees
Employee contributions	8.00%	9.00%
Benefit multiplier	2.50%	2.33%
Cost-of-living increase	Varies by retirement date	1% starting in 7 <sup>th</sup> year of retirement
Unused sick and vacation time	Included in final average earnings	Not included in final average earnings

These changes decreased the normal cost by \$35,000.

A summary of plan provisions is in Section 4, Exhibit II.

## Section 2: Actuarial Valuation Results

### Development of Unfunded/(Overfunded) Actuarial Accrued Liability for Year Ended June 30, 2020

1	Unfunded/(overfunded) actuarial accrued liability at beginning of year	\$217,901,997
2	Normal cost at beginning of year	5,671,978
3	Total contributions	(19,861,147)
4	Interest on 1, 2 & 3	16,142,486
5	Expected unfunded/(overfunded) actuarial accrued liability	\$219,855,314
6	Changes due to:	
	• Actuarial loss (investment and data)	\$13,012,217
	• Assumptions	1,768,110
	• Funding method	0
	• Plan provisions	(2,217)
	Total changes	<u>\$14,778,110</u>
7	Unfunded/(overfunded) actuarial accrued liability at end of year	<u>\$234,633,424</u>

## Section 2: Actuarial Valuation Results

### Actuarially determined contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded/(overfunded) actuarial accrued liability. The actuarially determined contribution for the fiscal year ending June 30, 2022 is \$18,964,310, or 54.59% of pay.

The unfunded actuarial accrued liability is amortized with 3.25% annual increases in the payments. This methodology is generally tied to payroll with the contribution expected to remain constant as a percentage of pay. However, payroll is decreasing since the Plan is partially closed to new entrants. Thus the actuarially determined contribution will continue to increase as a result of this methodology chosen by the Town.

The contribution requirement as of July 1, 2021 is based on the data previously described, the actuarial assumptions and Plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

#### Actuarially Determined Contribution for Year Beginning July 1

	2021		2020	
	Amount	% of Projected Pay	Amount	% of Projected Pay
1. Total normal cost	\$5,379,727	15.99%	\$5,471,978	15.82%
2. Administrative expenses	200,000	0.59%	200,000	0.58%
3. Expected employee contributions	(2,555,996)	-7.60%	(2,666,611)	-7.71%
4. Employer normal cost: (1) + (2) + (3)	\$3,023,731	8.99%	\$3,005,367	8.69%
5. Actuarial accrued liability	\$467,435,036		\$453,661,398	
6. Actuarial value of assets	232,801,612		235,759,401	
7. Unfunded/(overfunded) actuarial accrued liability: (5) - (6)	\$234,633,424		\$217,901,997	
8. Payment on projected unfunded/(overfunded) actuarial accrued liability	15,343,640	45.60%	13,952,367	40.33%
9. Total Town cost: (4) + (8)	\$18,367,371	54.59%	\$16,957,734	49.02%
10. Total Pay	\$33,645,319		\$34,593,008	
11. Actuarially Determined Contribution for plan years ending June 30, 2022 and June 30, 2021*: (9) adjusted with 3.25% interest	\$18,964,310		\$17,508,860	

\* Actuarially determined contributions are assumed to be paid at the beginning of every year



## Section 2: Actuarial Valuation Results

### Reconciliation of actuarially determined contribution

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

#### Reconciliation of Actuarially Determined Contribution from July 1, 2020 to July 1, 2021

	Amount
Actuarially Determined Contribution as of July 1, 2020	\$17,508,860
• Expected amortization increase	470,000
• Change due to demographic experience <sup>1</sup>	(40,000)
• Change due to recognition of investment loss	670,000
• Change due to assumptions (mortality table, interest crediting rate on employee money)	(50,000)
• Change due to lower interest rate (7.55% to 7.50%)	161,000
• Change due to plan change (Police hired after December 31, 2019)	(40,000)
• Other plan actuarial experience	284,450
Total change	\$1,455,450
Actuarially Determined Contribution as of July 1, 2021	\$18,964,310

<sup>1</sup> Includes gains and losses due to mortality, pay, turnover, and retirements different than expected

## Section 2: Actuarial Valuation Results

### History of employer contributions

A history of the most recent years of contributions is shown below.

#### History of Employer Contributions: 2012 – 2022

<b>Fiscal Year Ended June 30</b>	<b>Actuarially Determined Contribution (ADC)<sup>1</sup></b>	<b>Actual Employer Contribution</b>	<b>Percent Contributed</b>
2012	\$9,206,982	\$9,206,982	100.0%
2013	9,330,687	9,371,591	100.4%
2014	10,186,709	10,251,091	100.6%
2015	11,045,908	11,045,908	100.0%
2016	11,879,286	11,856,283	99.8%
2017	12,737,344	12,738,134	100.0%
2018	13,706,771	13,706,771	100.0%
2019	15,430,438	15,430,456	100.0%
2020	16,416,732	16,414,737	100.0%
2021	17,508,860	- -	- -
2022	18,964,310	- -	- -

<sup>1</sup> Prior to 2014, this amount was the Annual Required Contribution (ARC)

## Section 2: Actuarial Valuation Results

### Risk

Since the actuarial valuation results are dependent on a given set of assumptions and data as of a specific date, there is a risk that emerging results may differ significantly as actual experience differs from the assumptions.

This report does not contain a detailed analysis of the potential range of future measurements, but does include a brief discussion of some risks that may affect the Plan.

- Investment Risk (the risk that returns will be different than expected)

If the actual return on market value for the next Plan Year were 1% different from the assumed (either higher or lower), the projected unfunded actuarial liability would change by about \$430,000 (this excludes the recognition of any historical gains/losses).

Since the Plan's assets are much larger than contributions, investment performance may create volatility in contribution requirements. For example, for each 1% difference in return from the assumed return, the actuarially determined contribution would increase or decrease by about \$30,000.

The market value rate of return over the last 10 years has ranged from a low of -2.13% to a high of 24.88%.

- Longevity Risk (the risk that mortality experience will be different than expected)

The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the actuarially determined contribution.

- Contribution Risk (the risk that actual contributions will be different from actuarially determined contribution)

The Plan's funding policy requires payment of the actuarially determined contribution. As long as this policy is adhered to, contribution risk is negligible.

- Demographic Risk (the risk that participant experience will be different than assumed)

Examples of this risk include:

- Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.
- More or less active participant turnover than assumed.

## Section 2: Actuarial Valuation Results

- Actual Experience Over the Last five years and Implications for the Future

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past five years:

The non-investment gain/loss for a year has ranged from a loss of \$4,234,738 to a gain of \$5,713,082.

The funded percentage on the actuarial value of assets has ranged from a low of 49.8% to a high of 57.0% since 2016.

- Maturity Measures

As pension plans mature, the cash need to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities.

Currently the Plan has a non-active to active participant ratio of 1.77. For the prior year benefits paid were \$10,370,808 more than contributions received. As the Plan matures, more cash will be needed from the investment portfolio to meet benefit payments.

## Section 2: Actuarial Valuation Results

### Allocation of Contributions for Fiscal Year Ending June 30, 2022

	Town and Board of Education	Police	Fire	Para- professionals	Dispatchers	Total
<b>1.</b> Employer normal cost						
a) Total normal cost	\$989,712	\$2,154,575	\$1,954,171	\$174,566	\$106,703	\$5,379,727
b) Administrative expenses *	86,677	41,990	44,351	22,766	4,216	200,000
c) Projected employee contributions	<u>655,965</u>	<u>790,932</u>	<u>878,594</u>	<u>125,783</u>	<u>104,722</u>	<u>2,555,996</u>
d) Employer normal cost: (a) + (b) + (c)	\$420,424	\$1,405,633	\$1,119,928	\$71,549	\$6,197	\$3,023,731
e) Number of participants	514	249	263	135	25	1,186
<b>2.</b> Actuarial Accrued Liability						
a) Active	\$43,694,446	\$46,623,922	\$44,653,643	\$4,576,415	\$1,307,122	\$140,855,548
b) Inactive vested	1,685,284	246,008	342,445	1,037,642	85,421	3,396,800
c) Retirees, beneficiaries and disabled	<u>98,103,931</u>	<u>99,090,107</u>	<u>119,926,426</u>	<u>1,833,127</u>	<u>4,229,097</u>	<u>323,182,688</u>
d) Total Actuarial Accrued Liability	\$143,483,661	\$145,960,037	\$164,922,514	\$7,447,184	\$5,621,640	\$467,435,036
<b>3.</b> Assets at Actuarial Value **	\$71,460,684	\$72,694,020	\$82,138,103	\$3,709,000	\$2,799,805	\$232,801,612
<b>4.</b> Unfunded Accrued Liability: (2d) – (3)	\$72,022,977	\$73,266,017	\$82,784,411	\$3,738,184	\$2,821,835	\$234,633,424
<b>5.</b> Payment on unfunded Accrued Liability (23-year amortization, effective interest rate 4.12%)						
a) Payment	\$4,709,878	\$4,791,165	\$5,413,611	\$244,455	\$184,531	\$15,343,640
b) Amortization years	23	23	23	23	23	23
c) Interest rate (1.0750 ÷ 1.0325 - 1)	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%
<b>6.</b> Annual cost as of July 1, 2020 (1d) + (5a)	\$5,130,302	\$6,196,798	\$6,533,539	\$316,004	\$190,728	\$18,367,371
<b>7.</b> Payroll	\$9,227,713	\$10,830,931	\$9,944,606	\$2,280,796	\$1,361,272	\$33,645,319
<b>8.</b> Cost as a percent of payroll	55.60%	57.21%	65.70%	13.85%	14.01%	54.59%
<b>9.</b> Actuarially Determined Contribution (ADC) for fiscal year ending June 30, 2022 (includes 3.25% interest)						
a) Normal cost and expenses	\$434,088	\$1,451,316	\$1,156,326	\$73,874	\$6,398	\$3,122,002
b) Amortization payment	<u>4,862,949</u>	<u>4,946,878</u>	<u>5,589,553</u>	<u>252,400</u>	<u>190,528</u>	<u>15,842,308</u>
c) ADC payable July 1, 2021	\$5,297,037	\$6,398,194	\$6,745,879	\$326,274	\$196,926	\$18,964,310

\* Allocated based on number of participants (excluding inactive non-vested)

\*\* Allocated based on ratio of Accrued Liability per group to total Accrued Liability

# Section 3: Supplemental Information

## Exhibit A: Table of Plan Demographics

	As of July 1		Change From Prior Year
Category	2020	2019	
Active participants in valuation:			
• Number	428	449	-4.7%
• Average age	49.7	50.1	-0.4
• Average years of benefit service	16.1	16.2	-0.1
• Projected total pay	\$33,645,319	\$34,593,008	-2.7%
• Projected average pay	78,611	77,045	2.0%
• Account balances	38,649,886	39,669,796	-2.6%
• Total active vested participants	329	359	-8.4%
Inactive vested participants	32	30	6.7%
Inactive nonvested participants due a refund	56	57	-1.8%
Beneficiaries with rights to a deferred benefit¹	1	1	0.0%
Retired participants:			
• Number in pay status²	633	623	1.6%
• Average age	70.3	70.5	-0.2
• Average monthly benefit	\$3,395	\$3,288	3.3%
Disabled participants:			
• Number in pay status	26	27	-3.7%
• Average age	57.2	56.5	0.7
• Average monthly benefit	\$3,119	\$3,020	3.3%
Beneficiaries:			
• Number in pay status	66	67	-1.5%
• Average age	79.0	79.9	-0.9
• Average monthly benefit	\$1,938	\$1,790	8.3%

<sup>1</sup> One alternate payee

<sup>2</sup> Counts include 17 alternate payees as of July 1, 2020 and 14 alternate payees as of July 1, 2019

## Section 3: Supplemental Information

### Exhibit B: Participants in Active Service as of June 30, 2020 by Age, Years of Benefit Service, and Average Pay

Age	Years of Benefit Service									
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	7	7	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	27	18	9	--	--	--	--	--	--	--
	\$94,548	\$88,490	--	--	--	--	--	--	--	--
30 - 34	27	8	15	4	--	--	--	--	--	--
	90,767	--	\$95,058	--	--	--	--	--	--	--
35 - 39	33	4	13	8	7	1	--	--	--	--
	89,504	--	94,571	--	--	--	--	--	--	--
40 - 44	43	3	2	11	17	10	--	--	--	--
	92,642	--	--	\$90,409	\$82,256	--	--	--	--	--
45 - 49	71	3	3	2	18	39	5	1	--	--
	98,655	--	--	--	91,786	\$108,518	--	--	--	--
50 - 54	61	1	3	6	22	20	7	2	--	--
	83,404	--	--	--	72,438	108,378	--	--	--	--
55 - 59	69	1	2	6	32	14	7	7	--	--
	61,498	--	--	--	48,879	86,532	--	--	--	--
60 - 64	61	--	--	1	37	18	4	1	--	--
	54,830	--	--	--	49,143	64,147	--	--	--	--
65 - 69	19	--	--	1	12	5	--	--	--	1
	55,731	--	--	--	44,749	--	--	--	--	--
70 & over	10	--	--	--	7	2	1	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	428	45	47	39	152	109	24	11	--	1
	\$78,611	\$83,536	\$91,398	\$67,290	\$62,032	\$95,969	\$84,289	\$84,408	--	--

## Section 3: Supplemental Information

### Exhibit C: Reconciliation of Participant Data

	Active Participants	Inactive Vested Participants	Deferred Beneficiaries	Inactive Non-Vested Participants	Disableds	Retired Participants	Beneficiaries	Total
<b>Number as of July 1, 2019</b>	<b>449</b>	<b>30</b>	<b>1</b>	<b>57</b>	<b>27</b>	<b>623</b>	<b>67</b>	<b>1,254</b>
• New participants	19	N/A	0	2	N/A	N/A	N/A	21
• Terminations – with vested rights	(7)	7	0	0	0	0	0	0
• Terminations – without vested rights	(2)	N/A	0	2	N/A	N/A	N/A	0
• Retirements	(28)	(4)	0	0	N/A	32	N/A	0
• Died with beneficiary	(1)	0	0	0	0	(6)	7	0
• Died without beneficiary	0	0	0	0	(1)	(19)	(8)	(28)
• Lump sum cash-outs	(2)	(1)	0	(5)	0	0	0	(8)
• Data adjustments	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>0</u>	<u>3</u>
<b>Number as of July 1, 2020</b>	<b>428</b>	<b>32</b>	<b>1</b>	<b>56</b>	<b>26</b>	<b>633</b>	<b>66</b>	<b>1,242</b>



## Section 3: Supplemental Information

### Exhibit D: Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended June 30, 2020	Year Ended June 30, 2019
Net assets at market value at the beginning of the year	\$225,746,327	\$226,333,194
<b>Contribution income:</b>		
• Employer contributions	\$16,414,737	\$15,430,456
• Employee contributions	3,446,410	3,285,398
• Less administrative expenses	<u>(181,217)</u>	<u>(193,141)</u>
<b>Net contribution income</b>	\$19,679,930	\$18,522,713
<b>Investment income</b>	<u>(\$4,704,328)</u>	<u>\$7,035,503</u>
<b>Total income available for benefits</b>	<b>\$14,975,602</b>	<b>\$25,558,216</b>
<b>Less benefit payments</b>	(\$30,231,955)	(\$26,145,083)
<b>Change in reserve for future benefits</b>	<b>(\$15,256,353)</b>	<b>(\$586,867)</b>
<b>Net assets at market value at the end of the year</b>	<b>\$210,489,974</b>	<b>\$225,746,327</b>

## Section 3: Supplemental Information

### Exhibit E: Development of the Fund through June 30, 2020

Year Ended June 30	Employer Contributions	Employee Contributions	Net Investment Return <sup>1</sup>	Admin. Expenses	Benefit Payments	Actuarial Value of Assets at Year-End
2011	\$8,450,588	\$3,202,897	\$13,936,902	\$168,672	\$17,226,184	\$181,960,021
2012	9,206,982	3,166,597	11,562,844	173,328	18,463,685	187,259,431
2013	9,371,591	3,201,993	11,850,003	169,296	19,311,391	192,202,331
2014	10,251,091	3,233,330	20,707,294	203,350	18,169,153	208,021,544
2015	11,045,908	3,284,777	11,044,858	175,370	19,519,299	213,702,418
2016	11,856,283	3,182,165	11,064,880	202,385	20,542,906	219,060,455
2017	12,738,134	3,398,227	14,397,222	203,873	21,252,122	228,138,043
2018	13,706,771	3,288,013	13,987,978	211,022	23,431,176	234,578,607
2019	15,430,456	3,285,398	8,803,164	193,141	26,145,083	235,759,401
2020	16,414,737	3,446,410	7,594,236	181,217	30,231,955	232,801,612

*Note: above figures do not include the DROP*

<sup>1</sup> Actuarial basis, net of investment fees

## Section 3: Supplemental Information

### Exhibit F: Definition of Pension Terms

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

<b>Actuarial Accrued Liability for Actives:</b>	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
<b>Actuarial Accrued Liability for Retirees and Beneficiaries:</b>	Actuarial Present Value of lifetime benefits to existing retirees and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
<b>Actuarial Cost Method:</b>	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution.
<b>Actuarial Gain or Loss:</b>	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
<b>Actuarially Equivalent:</b>	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
<b>Actuarial Present Value (APV):</b>	<p>The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is:</p> <p>Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)</p> <p>Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and</p> <p>Discounted according to an assumed rate (or rates) of return to reflect the time value of money.</p>
<b>Actuarial Present Value of Future Benefits:</b>	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The

## Section 3: Supplemental Information

	Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund of member contributions or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
<b>Actuarial Valuation:</b>	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
<b>Actuarial Value of Assets (AVA):</b>	The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
<b>Actuarially Determined:</b>	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the Plan.
<b>Actuarially Determined Contribution (ADC):</b>	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
<b>Amortization Method:</b>	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
<b>Amortization Payment:</b>	The portion of the pension plan contribution, or ADC, that is intended to pay off the Unfunded Actuarial Accrued Liability.
<b>Assumptions or Actuarial Assumptions:</b>	The estimates upon which the cost of the Plan is calculated, including: <u>Investment return</u> - the rate of investment yield that the Plan will earn over the long-term future; <u>Mortality rates</u> - the rate or probability of death at a given age for employees and retirees; <u>Retirement rates</u> - the rate or probability of retirement at a given age or service; <u>Disability rates</u> - the rate or probability of disability retirement at a given age;

## Section 3: Supplemental Information

	<p><u>Withdrawal rates</u> - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;</p> <p><u>Salary increase rates</u> - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.</p>
<b>Closed Amortization Period:</b>	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.
<b>Decrements:</b>	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
<b>Defined Benefit Plan:</b>	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
<b>Defined Contribution Plan:</b>	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
<b>Employer Normal Cost:</b>	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
<b>Experience Study:</b>	A periodic review and analysis of the actual experience of the Plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.
<b>Funded Ratio:</b>	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
<b>GASB 67 and GASB 68:</b>	Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.
<b>Investment Return:</b>	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.
<b>Net Pension Liability (NPL):</b>	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.

## Section 3: Supplemental Information

<b>Normal Cost:</b>	The portion of the Actuarial Present Value of Future Benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.
<b>Open Amortization Period:</b>	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.
<b>Plan Fiduciary Net Position:</b>	Market value of assets.
<b>Total Pension Liability (TPL):</b>	The actuarial accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.
<b>Unfunded Actuarial Accrued Liability:</b>	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
<b>Valuation Date or Actuarial Valuation Date:</b>	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

# Section 4: Actuarial Valuation Basis

## Exhibit I: Actuarial Assumptions, Actuarial Cost Method and Models

### Rationale for Assumptions

Most assumptions, unless otherwise noted, are based on an experience study which was completed in 2017. Furthermore, the current data is reviewed in conjunction with each annual valuation. Based on professional judgment, the following assumptions were changed:

- The net investment return assumption was lowered from 7.55% to 7.50% to better reflect future expected experience. This assumption is selected by the Town.
- Mortality for males was projected an additional year using Scale BB. The mortality scale used for females was updated from Scale MP-2018 to Scale MP-2020.
- The interest crediting rate on employee money assumption was lowered from 3.00% per year to 2.50% per year to better reflect future expectations.

### Net Investment Return:

7.50% (previously 7.55%). This assumption is selected by the Town.

The net investment return assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment in consultation with the Town and its asset advisors. 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.

### Pay Increases:

General, Dispatcher and Paraprofessional Employees		Police Employees		Fire Employees	
Age	Rate	Age	Rate	Age	Rate
20	9.00%	20	20.00%	20	22.00%
25	7.38%	25	12.92%	25	14.71%
30	5.75%	30	5.83%	30	7.42%
35	4.13%	35	3.00%	35	4.50%
40	2.50%	40	3.00%	40	4.50%
45	2.50%	45	3.00%	45	4.50%
50	2.50%	50	3.00%	50	4.50%
55	2.50%	55	3.00%	55	4.50%
60	2.50%	60	3.00%	60	4.50%

### Mortality Rates:

*Males:* RP-2000 Combined Healthy Mortality Table with Blue Collar Adjustment, projected 23 years (previously 22) with Scale BB

*Females:* Separate RP-2014 Tables (adjusted back to 2006), projected generationally with Scale MP-2020 (previously, Scale MP-2018).

The mortality rates were based on historical and current data, adjusted to reflect estimated future experience and professional judgment.

## Section 4: Actuarial Valuation Basis

**Termination Rates Before Retirement (unisex unless otherwise noted):**

Age	Rate (%)			
	<u>Disability</u>		<u>Withdrawal</u>	
	General Employees and Dispatchers	Police and Fire	General Employees and Dispatchers	Paraprofessionals
20	0.02	0.06	10.41	39.93
25	0.03	0.09	6.31	27.71
30	0.03	0.11	4.54	20.70
35	0.04	0.15	3.50	15.63
40	0.07	0.22	2.77	11.54
45	0.11	0.36	2.20	8.07
50	0.18	0.61	1.74	5.06
55	0.30	1.01	1.34	2.39
60	0.49	1.63	1.00	1.19

Note: Paraprofessionals are not eligible for disability benefits, and therefore have no disability assumption separate from the withdrawal rates.

The termination rates and disability rates were based on historical and current 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 by age and the projected number based on the prior years' assumptions.

**Withdrawal rates for Police and Fire:**

3.00% per year for the first 10 years of service; none thereafter.

**Service-related benefits:**

100% of Police and Fire deaths and disabilities are assumed to be service-related. For the other groups, no service-related decrements are assumed.

**Retirement Rates:**

General Employees		Paraprofessionals	
Age	Rate*	Age	Rate*
Under 55	0%	Under 65	0%
55 – 59	2%	65 – 69	10%
60 – 61	5%	70 – 71	10%
62 – 63	10%	72 – 74	35%
64	25%	75	100%
65 – 69	45%		
70	100%		

\* Rates are changed to 40% upon eligibility for the Rule of 85.



## Section 4: Actuarial Valuation Basis

### Retirement Rates (continued)

Police Employees		Fire Employees	
Years of Service	Rate*	Years of Service	Rate*
Less than 25	0%	Less than 25	0%
25	90%	25	40%
26 – 29	15%	26 – 29	15%
30+	35%	30+	35%

\* Rate Increases to 100% upon attainment of age 65.

<b>Retirement Rates for Dispatchers:</b>	100% upon first becoming eligible for Normal Retirement, but not prior to age 62			
<b>Retirement Rates for Inactive Vested Participants:</b>	Age 62; Age 65 for Paraprofessionals The retirement rates were based on historical and current 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' assumptions.			
<b>Percent Married:</b>	50% of the male participants and 20% of the female participants are assumed to be married and electing a Joint & Survivor annuity.			
<b>Age of Spouse:</b>	Females three years younger than males.			
<b>Liability Load for unused sick and vacation pay:</b>	To approximate the effect of including overtime and unused sick and vacation pay in the final average salary, plan liabilities are increased by the percentages listed below:			
	<b>Retirement Liability</b>	<b>Death Liability</b>	<b>Disability Liability</b>	<b>Withdrawal Liability</b>
<i>General Employees and Dispatchers hired before 12/01/1996</i>	13.0%	6.0%	6.0%	2.0%
<i>General Employees and Dispatchers hired after 12/01/1996</i>	3.0%	2.0%	2.0%	2.0%
<i>Fire hired before 01/01/1995</i>	25.0%	12.0%	12.0%	2.0%
<i>Fire hired after 01/01/1995 (overtime only)</i>	5.0%	0.0%	0.0%	0.0%
<i>Police</i>	16.0%	12.0%	12.0%	2.0%
<i>Paraprofessionals</i>	0.0%	0.0%	0.0%	0.0%
<b>Administrative Expenses:</b>	\$200,000 per year, added to normal cost. The annual administrative expense were based on historical and current data, adjusted to reflect estimated future experience and professional judgment.			

## Section 4: Actuarial Valuation Basis

<b>Actuarial Value of Assets:</b>	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. On July 1, 2014, there was a one-time write-up to 97% of the market value of assets.
<b>Actuarial Cost Method:</b>	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 service, with Normal Cost determined as if the current benefit accrual rate had always been in effect.
<b>Models:</b>	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

## Section 4: Actuarial Valuation Basis

### Exhibit II: Summary of Plan Provisions

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

<b>Plan Year:</b>	July 1 through June 30					
<b>Plan Status:</b>		<b>General Employees (Town &amp; BOE)</b>	<b>Paraprofessionals</b>	<b>Dispatchers</b>	<b>Police</b>	<b>Fire</b>
		Closed to new hires effective January 1, 2006	Closed to new hires effective July 1, 2015	Ongoing	Ongoing	Ongoing
<b>Normal Retirement:</b>	<ul style="list-style-type: none"> <li>Regular Compensation: Annual salary or wages for services with the Town, including overtime, holiday, longevity payments and vacation pay</li> <li>Final Average Salary (FAS): Average of Regular Compensation earned during the highest 36 consecutive months of employment</li> <li>Amount: Multiplier times FAS times years of service, subject to the Minimum and Maximum listed on the next page</li> </ul>					
		<b>General Employees (Town &amp; BOE)</b>	<b>Paraprofessionals</b>	<b>Dispatchers</b>	<b>Police</b>	<b>Fire</b>
	Eligibility requirement	<i>Hired prior to March 1, 1983:</i> Later of age 62 and 8 years of service <i>Hired after March 1, 1983:</i> Later of age 65 and 10 years of service, or age 62 and 25 years of service, if earlier	Earliest of: - Age 65 and 10 years of service - Age 62 and 25 years of service - Rule of 85	Earliest of: - Age 65 and 5 years of service - 25 years of service - Rule of 75	25 years of service, no later than age 65 with 15 years of service	25 years of service, no later than age 65 with 10 years of service
	Multiplier	2.33%	2.20%	2.20%	<i>Hired prior to December 31, 2019:</i> 2.50% <i>Hired after December 31, 2019:</i> 2.33%	<i>Hired prior to May 18, 2017:</i> 2.50% <i>Hired after May 18, 2017:</i> 2.33%

## Section 4: Actuarial Valuation Basis

Normal Retirement (continued):		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Lump Sum of unused vacation and/or sick leave included in FAS	<i>Hired prior to December 1, 1996:</i> Unused vacation (40 days max) and sick leave (90 days max) <i>Hired after December 1, 1996:</i> Unused vacation (40 days max)	None	<i>Hired prior to December 1, 1996:</i> Unused vacation (40 days max) and sick leave (90 days max) <i>Hired after December 1, 1996:</i> Unused vacation (40 days max)	<i>Hired prior to December 31, 2019:</i> Unused vacation and sick leave <i>Hired after December 1, 2019:</i> None	<i>Hired prior to January 1, 1995:</i> Unused vacation and sick leave <i>Hired after January 1, 1995:</i> None
	Maximum benefit	70% of FAS	70% of FAS	70% of FAS	<i>Hired prior to December 31, 2019:</i> 75% of FAS <i>Hired after December 31, 2019:</i> 70% of FAS	<i>Hired prior to January 1, 1995:</i> 75% of FAS <i>Hired after January 1, 1995 but prior to May 18, 2017:</i> 75% of FAS, not more than 100% of base salary <i>Hired after May 18, 2017:</i> 70% of FAS
	Monthly Minimum	\$125 (after 20 years)	None	None	\$125	\$125

## Section 4: Actuarial Valuation Basis

Early Retirement:		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Eligibility Requirement	<i>Hired prior to March 1, 1983:</i> Later of age 52 and 8 years of service <i>Hired after March 1, 1983:</i> Later of age 55 and 10 years of service	N/A	Age 55 and 5 years of service	N/A	N/A
	Reduction	0.4167% for each month prior to Normal Retirement Age; unreduced at Rule of 85	N/A	0.4167% for each month prior to Normal Retirement Age	N/A	N/A
<ul style="list-style-type: none"> <li>Amount: Normal pension accrued times reduction factor</li> </ul>						
Benefit Service:	Elapsed time including years and months from plan entry					
Non-Service Connected Disability:		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Age Requirement	None	N/A	None	None	None
	Service Requirement	10 years	N/A	5 years	5 years	5 years
	Minimum	N/A	N/A	N/A	20% of FAS	20% of FAS
<ul style="list-style-type: none"> <li>Amount: Normal pension accrued based on service and FAS at disability, payable immediately without reduction</li> </ul>						

## Section 4: Actuarial Valuation Basis

Service Connected Disability:		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Age Requirement	None	N/A	None	None	None
	Service Requirement	None	N/A	None	None	None
	Pay	Greater of FAS or Regular Compensation	N/A	Greater of FAS or annual rate of pay	Greater of FAS or Regular Compensation*	Greater of FAS or Regular Compensation
	Amount	50% of pay, plus 2.33% of Pay for each year of service in excess of 25	NA	50% of pay, plus 2.20% of Pay for each year of service in excess of 25	<i>Under 20 years of service: 50% of Pay 20 or more years of service: Normal retirement benefit</i>	<i>Under 20 years of service: 50% of Pay 20 or more years of service: Normal retirement benefit</i>
	Maximum**	70% of FAS	N/A	70% of FAS	None	None
<p>*Includes lump sum of sick and unused vacation time</p> <p>**Payments from this benefit plus Workers' compensation and Social Security may not exceed 100% of Final Average Salary at disability</p> <p>This benefit is payable immediately and is unreduced for early retirement</p>						
Vesting:		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Age Requirement	None	None	None	None	None
	Service Requirement	<i>Hired prior to March 1, 1983: 8 years Hired after March 1, 1983: 10 years</i>	10 years	5 years	15 years	10 years
<ul style="list-style-type: none"> <li>Amount: Normal pension accrued, payable no earlier than Early Retirement Age, if vested. If not vested, return of contributions with interest</li> </ul>						

## Section 4: Actuarial Valuation Basis

Spouse's Pre-Retirement Death Benefit:		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Age Requirement	None	N/A	55	N/A	N/A
	Service Requirement	10 years	N/A	5 years	N/A	N/A
	Amount	80% of accrued benefit that would have been payable as a life annuity	N/A	100% of accrued benefit that would have been payable as a 100% J&S	N/A	N/A
<ul style="list-style-type: none"> <li>Other requirement: Die while in active service</li> </ul> <p>This benefit is payable immediately to the spouse of the participant without reduction</p>						
Dependent's Pre-Retirement Death Benefit- Non-Service Connected:		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Age Requirement	N/A	N/A	N/A	None	None
	Service Requirement	N/A	N/A	N/A	5 years	5 years
	Amount	N/A	N/A	N/A	Normal pension accrued at death	Normal pension accrued at death
	Minimum	N/A	N/A	N/A	20% of FAS	20% of FAS
<ul style="list-style-type: none"> <li>Other requirement: Die while in active service from causes not related to employment with the Town</li> </ul> <p>This benefit is payable immediately without reduction</p>						

## Section 4: Actuarial Valuation Basis

Dependent's Pre-Retirement Death Benefit- Service Connected:		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Age Requirement	N/A	N/A	N/A	None	None
	Service Requirement	N/A	N/A	N/A	None	None
	Amount	N/A	N/A	N/A	<i>Under 20 years of service: 50% of Pay</i> <i>20 or more years of service: Normal retirement benefit</i>	<i>Under 20 years of service: 50% of Pay</i> <i>20 or more years of service: Normal retirement benefit</i>
	Maximum	N/A	N/A	N/A	100% of Regular Compensation	100% of Regular Compensation
<ul style="list-style-type: none"> <li>Other requirement: Die while in active service during the performance of essential duties pertaining to employment with the Town, or while receiving a Service Connected Disability benefit</li> </ul> <p>This benefit is payable immediately without reduction</p>						
<b>Pre-Retirement Death Benefit:</b>	<ul style="list-style-type: none"> <li>Eligibility: Not eligible for Spouse or Dependent's Pre-Retirement Death Benefit</li> <li>Amount: Return of Contributions with interest</li> </ul>					
Post-Retirement Death Benefit:		General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
	Amount	Contributions with interest, less benefits paid	Contributions with interest, less benefits paid	Contributions with interest, less benefits paid	75% of the amount the participant was receiving*	75% of the amount the participant was receiving*
*Minimum guarantee of employee contributions plus interest, less benefits paid						



## Section 4: Actuarial Valuation Basis

### Employee Contributions:

	General Employees (Town & BOE)	Paraprofessionals	Dispatchers	Police	Fire
Rate of Regular Compensation	9.00%	6.00%	8.00%	Hired prior to December 31, 2019: 8.00% Hired after December 31, 2019: 9.00%	9.00%

Contributions are not required once the participant has reached the maximum pension benefit

Interest on employee contributions was credited at 4.00% per year prior to July 1, 2015. For the 2015 plan year, interest on employee contributions was credited at 0%. Effective July 1, 2016, the contributions are credited at 120% of the Federal Mid-Term rate as of July.

Employees who terminated after becoming vested will receive interest on their contributions through their retirement date. Employees who terminate before becoming vested will only receive interest on their contributions through their date of termination.

### Cost-of-Living:

General Employees (Town & BOE)		
	Increase	First Payable
<b>Retirees and Beneficiaries</b>		
Retired prior to January 1, 1991	2.00% per year	One year after retirement
Retired on or after January 1, 1991, but before July 1, 2005	1.00% per year	One year after retirement
Retired on or after July 1, 2005, but before July 1, 2025	2.00% per year	January that is five full years after retirement
Retired on or after July 1, 2025	1.50% per year	January that is five full years after retirement
<b>Disabled</b>		
Retired after December 1, 1996, but before December 31, 2005	1.00% per year	One year after retirement

## Section 4: Actuarial Valuation Basis

### Cost-of-Living (continued):

Police		
	Increase	First Payable
<b>Hired before December 31, 2019</b>		
Retired prior to January 1, 1991	2.00% per year	One year after retirement
Retired on or after January 1, 1991, but before December 31, 1999	1.00% per year	One year after retirement
Retired on or after January 1, 2000	2.00% per year	Fifth year of retirement
<b>Hired after December 31, 2019</b>	1.00% per year	Seventh year of retirement
<b>Fire</b>		
	Increase	First Payable
<b>Hired before May 18, 2017</b>		
Retired prior to January 1, 1991	2.00% per year	One year after retirement
Retired on or after January 1, 1991, but before June 30, 2005	1.00% per year	One year after retirement
Retired on or after July 1, 2005	1.00% per year (years 5 through 9), then 2.00% per year	Fifth year of retirement, increasing in ninth year of retirement
<b>Hired after May 18, 2017</b>	1.00% per year	Seventh year of retirement

Participants in the Dispatchers and Paraprofessionals groups are not eligible for a cost-of-living increase

### Deferred Retirement Option Plan (DROP):

- Eligibility: Employees in service in the Police and Fire groups on or after July 1, 2005 who have 25 or more years of service but less than 30 years of service.
- Amount: 96% of the participant's benefit at Normal Retirement. During the DROP period, the payments will be made to a separately designated DROP account while the member remains active. At the end of the DROP period (when the employee reaches 30 years of service or terminates, if sooner), the monthly benefit increases to 100% and the member is eligible to receive their accumulated DROP payments with 4% interest.

## Section 4: Actuarial Valuation Basis

### Changes in Plan Provisions:

The following table details the change in plan provisions that will apply for Police employees hired after December 31, 2019. This plan change is included for the first time in this valuation:

Plan Provision	Pre-12/31/2019 Police Employees	Post-12/31/2019 Police Employees
Employee contributions	8.00%	9.00%
Benefit multiplier	2.50%	2.33%
Cost-of-living increase	Varies by retirement date	1% starting in 7 <sup>th</sup> year of retirement
Unused sick and vacation time	Included in final average earnings	Not included in final average earnings