Town of Johnston, Rhode Island Firefighters Pension System

Actuarial Valuation and Review as of June 30, 2020

Segal

Segal

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November 6, 2020

Joseph Chiodo, CPA, MBA
Finance Director
Town of Johnston, Rhode Island Firefighters Pension System
1385 Hartford Avenue
Johnston, Rhode Island, 02919

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2020. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for the 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 Pension System. The census information information on which our calculations were based was prepared by the Town of Johnston and the financial information was retained from the Town of Johnston trial balance and journal entries for the fiscal year ended June 30, 2020. That assistance is gratefully acknowledged.

The actuarial calculations were directed under our supervision. We are members of the American Academy of Actuaries and we meet 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 this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions recommended by Segal in our experience study for the period July 1, 2014 to June 30, 2017, dated November 30, 2017, as approved by the Town are reasonably related to the experience of and the expectations for the Pension System.

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

Sincerely,
Segal

Jeanette R. Cooper

Jeanette R. Cooper, FSA, FCA, MAAA, EA
Vice President and Consulting Actuary

Malichi Waterman

Malichi S. Waterman, FCA, MAAA, EA
Consulting Actuary

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Actuarial Valuation Summary

Purpose and basis

This report was prepared by Segal to present a valuation of the Town of Johnston, Rhode Island Firefighters Pension System as of June 30, 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 Pension System assets to cover the estimated cost of settling the Pension System'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.

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

The contribution requirements presented in this report are based on:

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

Significant issues

1. Segal Consulting ("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. The funding policy adopted by the Town as outlined in the 2017 settlement agreement meets this standard.
2. Under the settlement agreement, the employer contribution for the fiscal year ending June 30, 2017 could not be less than $3,924,554, with this amount increasing 3.00% per year. The contribution for the fiscal year ending June 30, 2022 is $4,549,634, an increase of $132,514 from last year. The increase is due to the required 3.0% increase outlined in the settlement agreement. Actual contributions made during the fiscal year ending June 30, 2020 were $4,288,466. In the prior fiscal year, actual contributions were $4,163,560.
3. Beginning with the fiscal year ending June 30, 2019, the actuarially determined contribution amount was changed to match the required contributions under the settlement agreement. Prior to this, the actuarially determined contribution was based on a level dollar closed period. The Town of Johnston has paid 100% of the actuarially determined contribution for the fiscal year ending June 30, 2020.
4. The actuarial value of assets for the Pension System is equal to market value.
5. The effective amortization period for the unfunded actuarial accrued liability is 25.48 years, a decrease from 25.74 years in the prior valuation.
6. The unfunded actuarial accrued liability is $57,166,013, which is an increase of $1,556,294 since the prior valuation. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 28.97%, compared to the prior year funded ratio of 30.03%. This ratio is one measure of funding status, and its history is a measure of funding progress. These measurements are not necessarily appropriate for assessing the sufficiency of assets to cover the estimated cost of settling the Pension System's benefit obligation or the need for or the amount of future contributions.
7. The actuarial loss from investment and other experience is $1,343,008 or 1.7% of actuarial accrued liability.
8. The rate of return on the actuarial and market value of assets was -0.09% for the July 1, 2019 to June 30, 2020 plan year. This resulted in an actuarial investment loss of $1,732,008, or 2.2% of the actuarial accrued liability.
9. The net experience gain from sources other than investment experience was 0.5% of the actuarial accrued liability. This gain was primarily due to retirement and salary experience different than expected.
10. There were no changes in actuarial assumptions or plan provisions since the last valuation.

Section 1: Actuarial Valuation Summary

11. Plan assets are currently equal to roughly four years of projected benefit payments. The imbalance between benefit levels in the Pension System and the resources available to pay for them must continue to be addressed. We are available to prepare solvency projections upon request.
12. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution under the Pension System'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 were provided separately.
13. This actuarial report as of June 30, 2020 is based on financial and demographic data as of that date. Changes subsequent to that date are not reflected and will affect future actuarial costs of the plan.
14. 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 included a discussion of various risks that may affect the Plan in Section 2.
15. 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.

Summary of key valuation results

		2020	2019
Contributions for plan year beginning July 1[1]:	• Actuarially determined employer contributions	$4,549,634	$4,417,120
Actuarial accrued liability for plan year beginning July 1:	• Retired participants and beneficiaries	$62,524,412	$61,944,040
	• Active participants	17,957,420	17,536,410
	• Total	80,481,832	79,480,450
	• Normal cost including administrative expenses for plan year beginning July 1	741,460	739,348
Assets for plan year beginning July 1:	• Market value of assets (MVA)	$23,315,819	$23,870,731
	• Actuarial value of assets (AVA)	23,315,819	23,870,731
	• Actuarial value of assets as a percentage of market value of assets	100.00%	100.00%
Funded status for plan year beginning July 1:	• Unfunded actuarial accrued liability on market value of assets	$57,166,013	$55,609,719
	• Funded percentage on MVA basis	28.97%	30.03%
	• Unfunded actuarial accrued liability on actuarial value of assets	$57,166,013	$55,609,719
	• Funded percentage on AVA basis	28.97%	30.03%
	• Effective Amortization period on an AVA basis	25.48 years	25.74 years
Key assumptions:	• Net investment return	7.25%	7.25%
	• Inflation rate	2.50%	2.50%
	• Payroll increase	3.75%	3.75%
Demographic data for plan year beginning July 1:	• Number of retired participants and beneficiaries	93	93
	• Number of active participants	18	19
	• Total payroll	$2,132,859	$2,149,454
	• Average payroll	118,492	113,129

[1]The amounts shown in the 2020 and 2019 columns are payable for the fiscal years ending in 2022 and 2021, respectively.

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:

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. 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 Town.
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: 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 Pension System, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Pension System.

Actuarial Valuation Results

Participant data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active 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 July 1, 1999, as shown in the declining count of active participants.

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

Participant Population: 2011 – 2020

Year Ended June 30	Active Participants	Retired Participants and Beneficiaries[1]	Ratio of Non-Actives to Actives
2011	39	75	1.92
2012	40	76	1.90
2013	35	80	2.29
2014	31	83	2.68
2015	30	83	2.77
2016	21	92	4.38
2017	19	94	4.95
2018	19	94	4.95
2019	19	93	4.89
2020	18	93	5.17

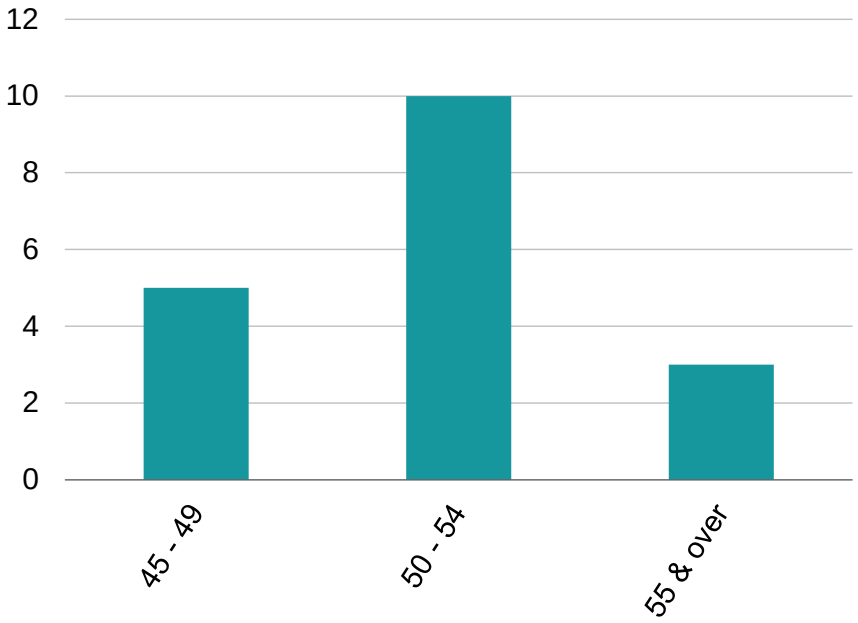
[1]Includes disabled retirees and QDROs.

Active participants

Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 18 active participants with an average age of 51.5, average years of service of 24.8 years and average payroll of $118,492. The 19 active participants in the prior valuation had an average age of 50.7, average service of 23.8 years and average payroll of $113,129.

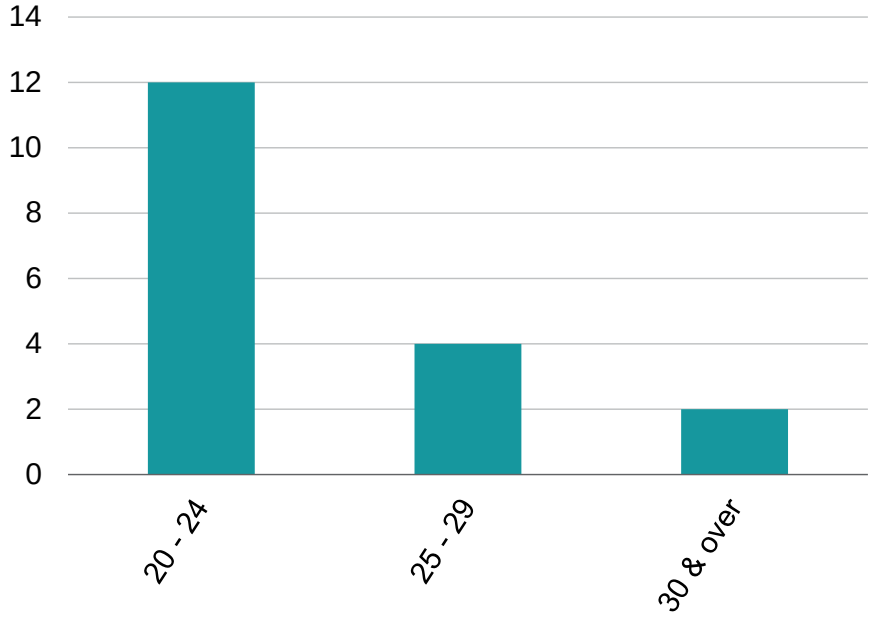
Distribution of Active Participants as of June 30, 2020

Actives by Age



Average age	51.5
Prior year average age	50.7
Difference	0.8

Actives by Years of Service



Average years of service	24.8
Prior year average years of service	23.8
Difference	1.0

Inactive participants

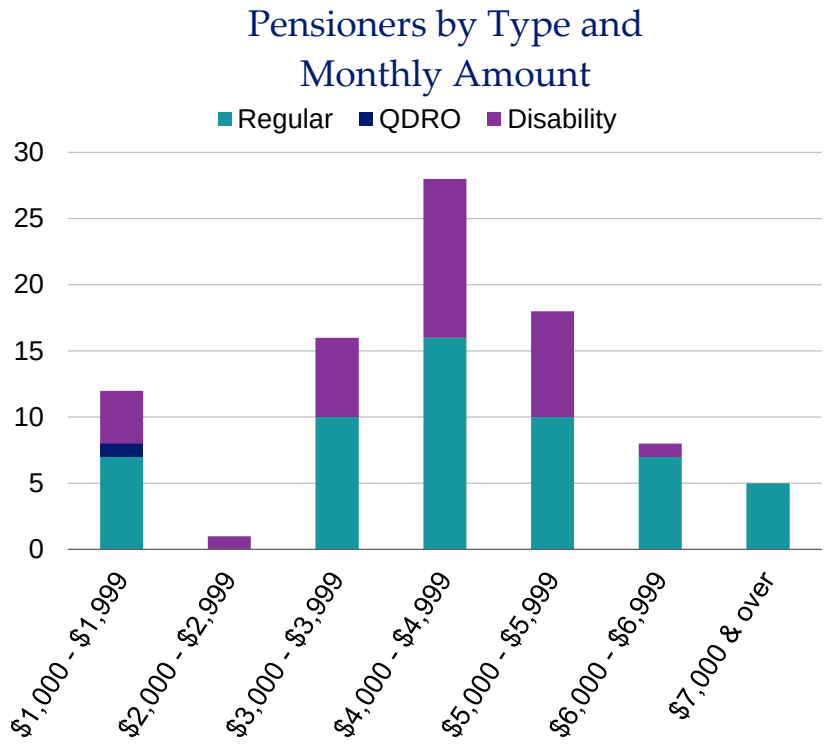
In this year's valuation, there were no participants with a vested right to a deferred or immediate vested benefit.

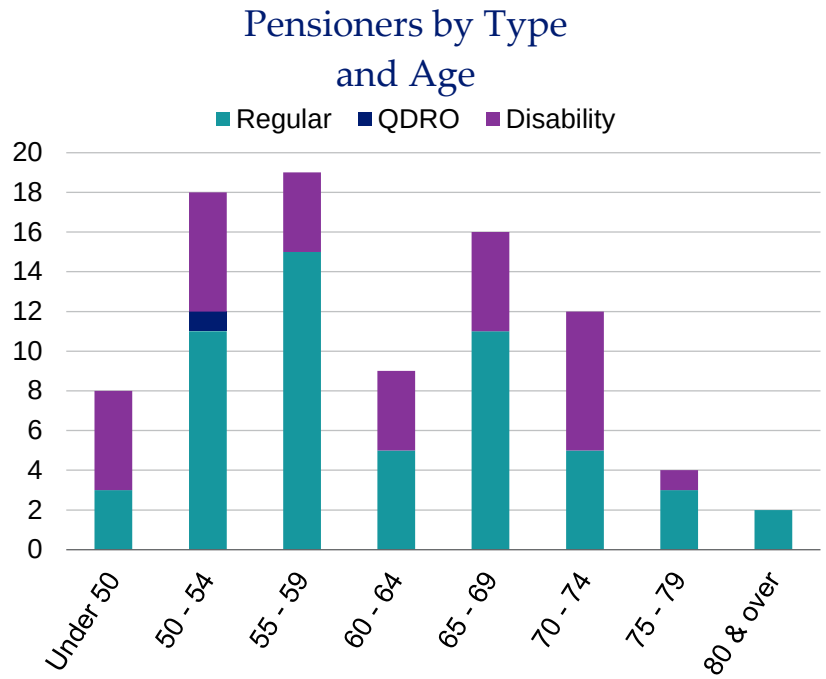
Retired participants and beneficiaries

As of June 30, 2020, 88 retired participants (including one QDRO) and five beneficiaries were receiving total monthly benefits of $404,214. For comparison, in the previous valuation, there were 89 retired participants (including one QDRO) and four beneficiaries receiving monthly benefits of $401,296.

As of June 30, 2020, the average monthly benefit for retired participants is $4,448, compared to $4,379 in the previous valuation. The average age for retired participants is 61.7 in the current valuation, compared with 62.0 in the prior valuation.

Distribution of Pensioners as of June 30, 2020





Historical plan population

The chart below demonstrates the decrease of the active population over the last ten years. The chart also shows the growth among the retired population over the same time period.

Participant Data Statistics: 2011 – 2020

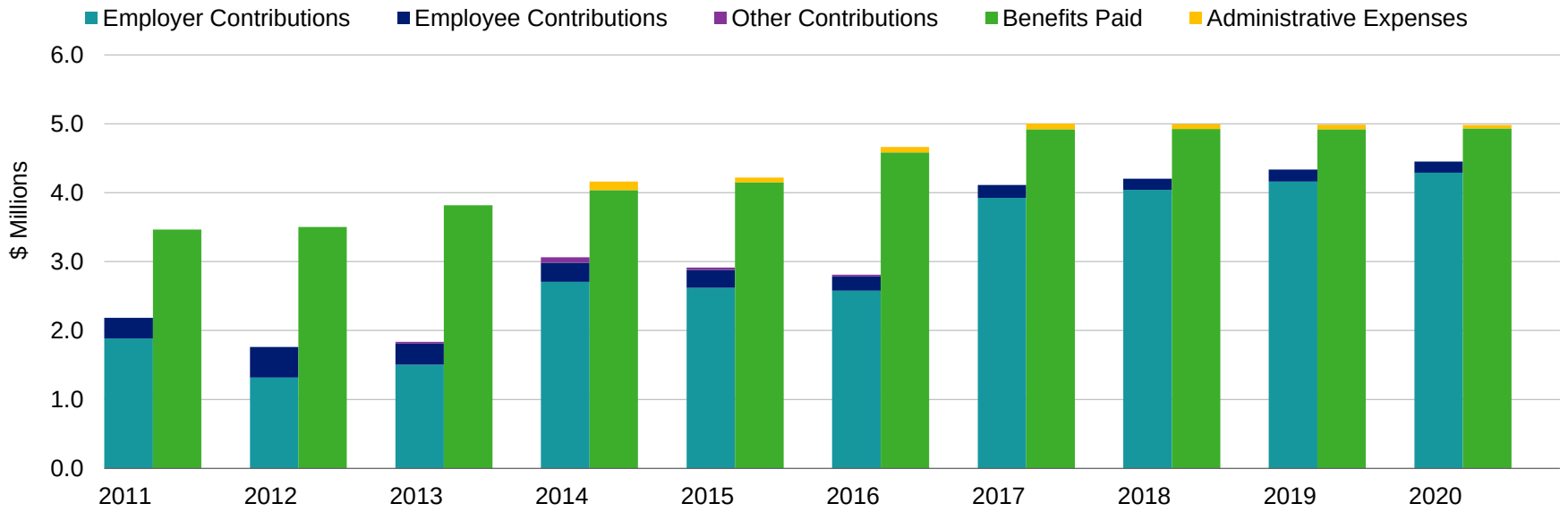
	Active Participants			Retired Participants and Beneficiaries		
Year Ended June 30	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2011	39	43.9	16.8	75	56.3	$4,057
2012	40	44.8	17.7	76	57.3	4,061
2013	35	45.4	18.3	80	57.9	4,156
2014	31	46.3	19.2	83	58.1	4,314
2015	30	47.2	20.2	83	58.9	4,391
2016	21	47.9	21.6	92	58.9	4,528
2017	19	48.7	21.8	94	59.6	4,607
2018	19	49.7	22.8	94	60.6	4,365
2019	19	50.7	23.8	93	61.6	4,315
2020	18	51.5	24.8	93	62.3	4,346

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 and Expenses 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. However, the Town has approved an asset valuation method that uses market value. Under this valuation method, the full value of market fluctuation is recognized in a single year and, as a result, the asset value and the plan costs are relatively volatile.

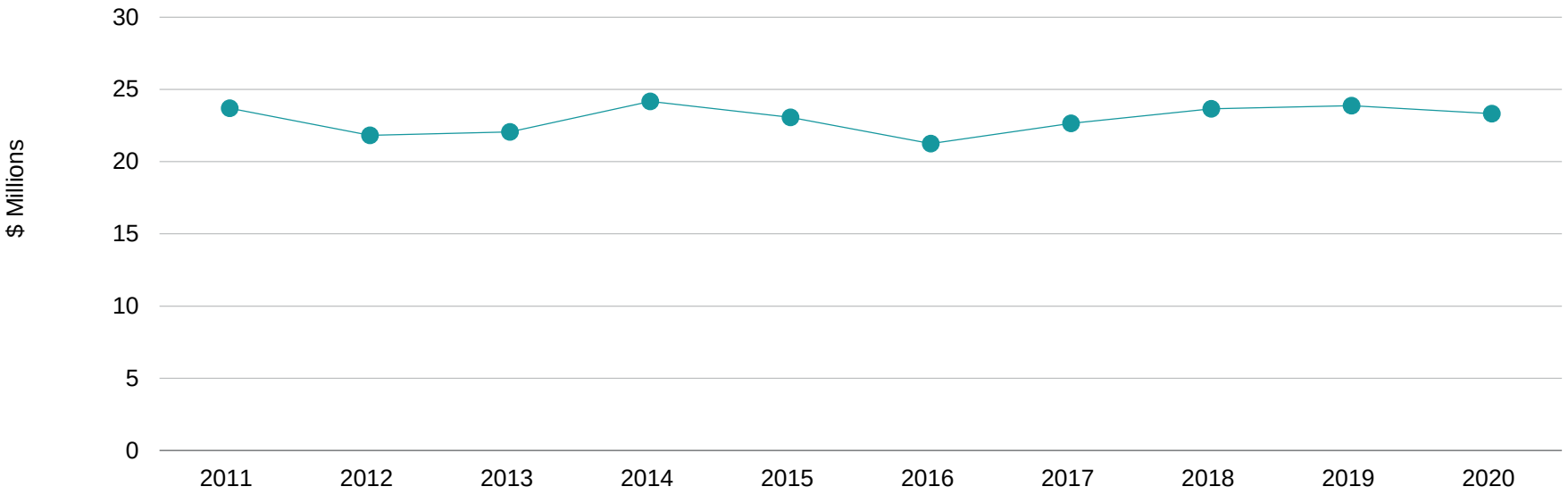
Determination of Actuarial Value of Assets for Year Ended June 30, 2020

Actuarial value of assets at beginning of year (equal to market value)	$23,870,731
Employer contributions	$4,288,466
Employee contributions	$161,588
Purchase of service	$0
Other Income	$0
Net investment income	-$20,744
Benefit payments	-$4,934,125
Administrative expense	-$50,097
Actuarial value of assets at end of year (equal to market value)	$23,315,819

Section 2: Actuarial Valuation Results

The actuarial value (equal to the market value of assets) is a representation of the Pension System's financial status. The actuarial asset value is significant because the Pension System'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 (equal to Market Value of Assets) as of June 30, 2011 – 2020



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.

The total loss is $1,343,008, which includes $1,732,008 from investment losses and $389,000 in gains from all other sources. The net experience variation from individual sources other than investments was 0.5% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

Actuarial Experience for Year Ended June 30, 2020

1	Net loss from investments[1]	-$1,732,008
2	Net gain from administrative expenses	41,994
3	Net gain from other experience[2]	347,006
4	Net experience loss: **1 + 2 + 3**	-$1,343,008

[1]Details on next page.

[2]Details on page 21.

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 Town of Johnston's investment policy. The rate of return on both an actuarial and market value of assets was -0.09% for the year ended June 30, 2020.

For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.25%. Since the actual return for the year was less than the assumed return, the Pension System experienced an actuarial loss during the year ended June 30, 2020 with regard to its investments.

Investment Experience

		Year Ended June 30, 2020	Year Ended June 30, 2019
		Actuarial and Market Value	Actuarial and Market Value
1	Net investment income	-$20,744	$858,655
2	Average value of assets	23,603,647	23,337,788
3	Rate of return: **1 ÷ 2**	-0.09%	3.68%
4	Assumed rate of return	7.25%	7.25%
5	Expected investment income: **2 x 4**	1,711,264	1,691,990
6	Actuarial gain/(loss): **1 - 5**	-$1,732,008	-$833,335

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 for the last ten years, including averages over select time periods.

Investment Return – Actuarial Value of Assets (equal to Market Value of Assets): 2011 - 2020

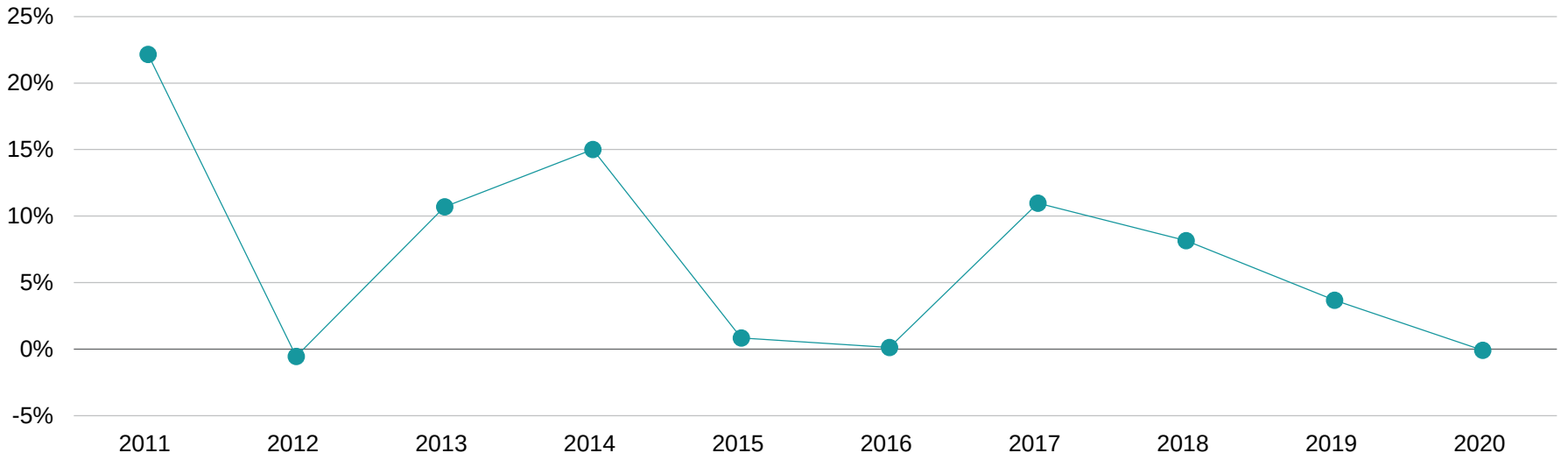
	Actuarial and Market Value Investment Return	
Year Ended June 30	**Amount**	**Percent**
2011	$4,414,857	22.16%
2012	-125,235	-0.55
2013	2,230,398	10.71
2014	3,228,280	15.01
2015	199,661	0.85
2016	29,412	0.13
2017	2,283,935	10.98
2018	1,814,122	8.15
2019	858,655	3.68
2020	-20,744	-0.09
Total	$14,913,341	
	Most recent five-year average return	4.43%
	Most recent ten-year average return	6.76%

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

Section 2: Actuarial Valuation Results

The actuarial value of assets has been equal to market value for the last ten years. This has resulted in relatively volatile actuarial rates of return and pension plan cost.

Actuarial Rates of Return (equal to Market Value Rates of Return) for Years Ended June 30, 2011 - 2020



Administrative expenses

- Administrative expenses for the year ended June 30, 2020 totaled $50,097, as compared to the assumption of $87,500 payable as of the beginning of the year. This resulted in a gain of $41,994 for the 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),
- the number of disability retirements (more or fewer than projected), and
- salary increases (greater or smaller than projected).

The net gain from this other experience for the year ended June 30, 2020 amounted to $347,006, which is 0.4% of the actuarial accrued liability.

Liability Changes Due to Demographic Experience for Year Ended June 30, 2020

Changes in benefit amounts	-$41,253
Salary increases less than expected	46,704
Retirement experience different than expected	284,862
Mortality experience	-45,342
Disability retirement experience different than expected	-146,862
Miscellaneous	248,897
Total	**$347,006**

Changes in the Actuarial Accrued Liability

The actuarial accrued liability as of June 30, 2020 is $80,481,832, an increase of $1,001,382, or 1.3%, from the actuarial accrued liability as of the prior valuation date. The liability is expected to grow each year with normal cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (as discussed in the previous subsection).

Actuarial assumptions

There were no assumption changes reflected in this report.

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

Plan provisions

There were no changes in plan provisions since the prior valuation.

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

Section 2: Actuarial Valuation Results

Development of Unfunded Actuarial Accrued Liability for Year Ended June 30, 2020

1	Unfunded actuarial accrued liability at beginning of year		$55,609,719
2	Normal cost at beginning of year		739,348
3	Total contributions		-4,450,054
4	Interest		
	• For whole year on **1 + 2**	$4,085,307	
	• For half year on **3**	-161,315	
	Total interest		3,923,992
5	Expected unfunded actuarial accrued liability		$55,823,005
6	Changes due to net experience gains and losses		$1,343,008
7	Unfunded actuarial accrued liability at end of year		$57,166,013

Actuarially determined contribution

The actuarially determined contribution is based on a settlement agreement whereby the employer contribution for the fiscal year ending June 30, 2017 could not be less than $3,924,554 with this amount increasing 3.00% per year. For the fiscal year ending June 30, 2022, the actuarially determined contribution is $4,549,634.

Based upon the required contribution of $4,549,634, the unfunded actuarial accrued liability of $57,166,013 as of June 30, 2020 is effectively being amortized over 25.48 years.

The contribution requirement as of June 30, 2020 are 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

		2020	2019
		Amount	Amount
1.	Total normal cost	$653,960	$651,848
2.	Administrative expenses	87,500	87,500
3.	Expected employee contributions	-170,629	-171,956
4.	Employer normal cost: (1) + (2) + (3)	$570,831	$567,392
5.	Actuarial accrued liability	$80,481,832	$79,480,450
6.	Actuarial value of assets	23,315,819	23,870,731
7.	Unfunded actuarial accrued liability: (5) - (6)	$57,166,013	$55,609,719
8.	Payment on Unfunded actuarial accrued liability	3,522,856	3,407,062
9.	Adjustment for timing[1]	455,947	442,666
10.	Actuarially determined contribution: (4) + (10) + (11)	$4,549,634	$4,417,120

[1]Actuarially determined contributions are assumed to be paid at the middle of the next fiscal year.

History of employer contributions

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

The Actuarially Determined Contribution (ADEC) is based on an actuarial valuation as of two years prior to the Fiscal Year End. With the adoption of the Funding Improvement Plan as of June 30, 2017, the ADEC shows a significant reduction between the Fiscal Year Ended June 30, 2018 and June 30, 2019.

History of Employer Contributions: 2012 – 2021

Fiscal Year Ended June 30	Actuarially Determined Employer Contribution (ADEC)[1] Amount	Actual Employer Contribution[2] Amount	Percent Contributed
2012	$4,866,078	$1,316,296	27.05%
2013	4,941,035	1,504,172	30.44%
2014	6,325,477	2,706,157	42.78%
2015	6,331,388	2,620,273	41.39%
2016	6,607,532	2,576,831	39.00%
2017	6,954,295	3,924,059	56.43%
2018	7,430,222	4,041,720	54.40%
2019	4,163,560	4,163,560	100.00%
2020	4,288,466	4,288,466	100.00%
2021	4,417,120	--	--

[1]The Actuarially Determined Employer Contribution for years ending prior to June 30, 2019 were based on valuations performed prior to the implementation of the Funding Improvement Plan.

[2]The Actual Employer Contributions meet the required amounts under the Funding Improvement Plan for years subsequent to June 30, 2018.

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 Pension System. Upon request, a more detailed assessment of the risks can be provided to the Trustees to enable a better understanding of the risks inherent in the Pension System. This assessment may include scenario testing, sensitivity testing, stress testing and stochastic modeling.

- 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 0.4%, or about $233,000.

  The market value rate of return over the last ten years has ranged from a low of -0.55% to a high of 22.16%.

- 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 Pension System'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 Ten Years and Implications for the Future

  Past experience can help demonstrate the sensitivity of key results to the Pension System's actual experience. Over the past ten years:

  The investment gain(loss) for a year has ranged from a loss of $1,894,150 to a gain of $3,925,658. If all investment returns were equal to the assumed return over the last ten years, the market value of assets as of the current valuation date would be approximately $30,069,246 as opposed to the actual value of $23,315,819.

  The non-investment gain(loss) for a year has ranged from a loss of $1,303,934 to a gain of $4,030,373.

  The funded percentage on the actuarial value of assets has ranged from a low of 24.3% to a high of 33.7% since 2011.

- 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 Pension System's asset allocation is aligned to meet emerging pension liabilities.

  Currently the Pension System has a non-active to active participant ratio of 5.17. For the prior year, benefit payments and administrative expenses paid were $534,168 more than contributions received. As the Pension System becomes better funded, more cash will be paid from the investment portfolio to meet benefit payments.

Supplemental Information

Exhibit A: Table of Plan Coverage

Category	Year Ended June 30 2020	2019	Change From Prior Year
Active participants in valuation:			
• Number	18	19	-5.3%
• Average age	51.5	50.7	0.8
• Average years of service	24.8	23.8	1.0
• Total payroll	$2,132,859	$2,149,454	-0.8%
• Average payroll	118,492	113,129	4.7%
• Account balances	2,380,075	2,322,895	2.5%
• Total active vested participants	18	19	-5.3%
Retired participants[1]:			
• Number in pay status	56	57	-1.8%
• Average age	62.0	61.4	0.6
• Average monthly benefit	$4,607	$4,549	1.3%
Disabled participants:			
• Number in pay status	32	32	0.0%
• Average age	61.2	61.1	0.1
• Average monthly benefit	$4,169	$4,075	2.3%
Beneficiaries:			
• Number in pay status	5	4	25.0%
• Average age	73.0	69.3	3.7
• Average monthly benefit	$2,564	$2,902	-11.6%

[1]Includes alternate payees receiving benefits subject to a QDRO.

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

		Years of Service		
Age	**Total**	**20 - 24**	**25 - 29**	**30 - 34**
45 - 49	5	5	- -	- -
	$115,881	$115,881	- -	- -
50 - 54	10	6	3	1
	118,320	114,087	$122,131	$132,286
55 - 59	3	1	1	1
	123,416	118,533	124,104	127,611
Total	18	12	4	2
	$118,492	$115,205	$122,625	$129,948

Exhibit C: Reconciliation of Participant Data

	Active Participants	Disableds	Retired Participants	Beneficiaries	Total
Number as of June 30, 2019	**19**	**32**	**57**	**4**	**112**
• Retirements	0	N/A	0	N/A	0
• New disabilities	-1	1	N/A	N/A	0
• Deceased	0	-1	-1	0	-2
• New beneficiary	0	0	0	1	1
• Lump sum cash-outs	0	0	0	0	0
• New QDRO[1]	0	0	0	0	0
Number as of June 30, 2020	**18**	**32**	**56**	**5**	**111**

[1]The data includes no new former spouses receiving benefits under qualified domestic relations orders (QDROs).

Exhibit D: Summary Statement of Income and Expenses on an Actuarial and Market Value Basis

	Year Ended June 30, 2020	Year Ended June 30, 2019
Net assets at actuarial and market value at the beginning of the year	$23,870,731	$23,663,500
Contribution income:		
• Employer contributions	$4,288,466	$4,163,560
• Employee contributions	161,588	171,202
• Purchase of service & other income	0	0
• Less administrative expenses	-50,097	-66,174
Net contribution income	*$4,399,957*	*$4,268,588*
Investment income	*-$20,744*	*$858,655*
Total income available for benefits	**$4,379,213**	**$5,127,243**
Less benefit payments	*-$4,934,125*	*-$4,920,012*
Change in reserve for future benefits	**-$554,912**	**$207,231**
Net assets at actuarial and market value at the end of the year	**$23,315,819**	**$23,870,731**

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

Year Ended June 30	Employer Contributions	Employee Contributions[1]	Net Investment Return[2]	Admin. Expenses[3]	Benefit Payments	Actuarial and Market Value of Assets at Year-End
2011	$1,886,017	$296,478	$4,414,857	$0	$3,463,917	$23,695,404
2012	1,316,296	444,235	-125,235	0	3,501,916	21,828,784
2013	1,504,172	306,620	2,230,398	0	3,818,702	22,051,272
2014	2,706,157	356,584	3,228,280	127,318	4,035,577	24,179,398
2015	2,620,273	295,539	199,661	71,000	4,148,770	23,075,101
2016	2,576,831	233,585	29,412	77,829	4,584,209	21,252,891
2017	3,924,059	185,921	2,283,935	84,157	4,918,521	22,644,128
2018	4,041,720	160,257	1,814,122	73,110	4,923,617	23,663,500
2019	4,163,560	171,202	858,655	66,174	4,920,012	23,870,731
2020	4,288,466	161,588	-$20,744	50,097	4,934,125	23,315,819

[1]Includes purchase of service
[2]Net of investment fees
[3]Shown separately beginning in 2014; prior to that included in net investment return

Exhibit F: Definition of Pension Terms

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

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	Actuarial Present Value of lifetime benefits to existing pensioners 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.
Actuarial Cost Method:	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.
Actuarial Gain or Loss:	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.
Actuarially Equivalent:	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	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: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Section 3: Supplemental Information

Actuarial Present Value of Future Benefits:	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 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.
Actuarial Valuation:	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 Actuariallv Determined Contributions.
Actuarial Value of Assets (AVA):	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 Actuariallv Determined Contribution.
Actuarially Determined:	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.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Town's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	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.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is intended to pay off the Unfunded Actuarial Accrued Liability.

Section 3: Supplemental Information

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Plan is calculated, including: Investment return - the rate of investment yield that the Plan will earn over the long-term future; Mortality rates - the rate or probability of death at a given age for employees and pensioners; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates - the rate or probability of disability retirement at a given age; Withdrawal rates - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.
Closed Amortization Period:	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.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
Defined Contribution Plan:	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.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	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.
Funded Ratio:	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.

Section 3: Supplemental Information

GASB 67 and GASB 68:	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.
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.
Net Pension Liability (NPL):	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
Normal Cost:	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.
Open Amortization Period:	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.
Plan Fiduciary Net Position:	Market value of assets.
Total Pension Liability (TPL):	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.
Unfunded Actuarial Accrued Liability:	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.
Valuation Date or Actuarial Valuation Date:	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.

Actuarial Valuation Basis

Exhibit I: Actuarial Assumptions, Actuarial Cost Method and Models

Rationale for Assumptions:	The information and analysis used in selecting each demographic assumption that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Review July 1, 2014 to June 30, 2017 dated November 30, 2017. Please see this study for the rationale for each assumption used. As noted in this study, due to the low number of participants in the Police and Firefighters System, the mortality experience is not credible. It is our understanding that the State of Rhode Island deems the mortality assumptions reasonable if they match the assumptions used for the State of Rhode Island Municipal Employees Retirement System (MERS). Therefore, the mortality assumptions shown below match the MERS assumptions used.
Net Investment Return:	7.25% 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 Pension System's target asset allocation.
Inflation:	2.50%
Salary Increases:	3.75%; including 2.50% for inflationary increases, 0.50% for productivity increases and 0.75% for promotional and longevity increases.
Cost-of-Living Adjustments:	0% through June 30, 2022; 1.25% compounded annually commencing July 1, 2022.
Mortality Rates:	
Pre-retirement:	RP-2014 Employee Mortality Table
Healthy annuitants:	Male: RP-2014 Blue Collar Healthy Annuitant Mortality Table for males, projected generationally with scale MP-2016 Female: RP-2014 Healthy Annuitant Mortality Table for females, projected generationally with scale MP-2016
Disabled annuitants:	RP-2014 Disabled Retiree Mortality Table, projected generationally with scale MP-2016

Section 4: Actuarial Valuation Basis

Annuitant Mortality Rates:

	Rate (%)			
	Healthy[1]		Disabled[1]	
Age	Male	Female	Male	Female
55	0.60%	0.36%	2.34%	1.45%
60	0.85	0.52	2.66	1.70
65	1.26	0.80	3.17	2.09
70	1.97	1.29	4.03	2.82
75	3.15	2.09	5.43	4.10
80	5.19	3.48	7.66	6.10
85	8.68	6.05	11.33	9.04
90	14.64	10.71	17.30	13.27

[1]Rates shown do not include generational projection.

Termination Rates Before Retirement:

	Rate (%)					
	Mortality		Disability		Withdrawal	
Age	Male	Female	Male	Female	Male	Female
20	0.04%	0.02%	0.00%	0.00%	0.00%	0.00%
25	0.05	0.02	0.34	0.34	0.00	0.00
30	0.05	0.02	0.44	0.44	0.00	0.00
35	0.05	0.03	0.58	0.58	0.00	0.00
40	0.06	0.04	0.88	0.88	0.00	0.00
45	0.10	0.07	1.44	1.44	0.00	0.00
50	0.17	0.11	2.42	2.42	0.00	0.00
55	0.28	0.17	0.00	0.00	0.00	0.00
60	0.47	0.24	0.00	0.00	0.00	0.00

Note: 100% of deaths and disabilities are assumed to be service related.

Section 4: Actuarial Valuation Basis

Retirement Rates:	<table><tr><th>Years of Service</th><th>Retirement Probability</th></tr><tr><td>20</td><td>75%</td></tr><tr><td>21 - 25</td><td>50%</td></tr><tr><td>26 or more</td><td>100%</td></tr></table> *All employees are assumed to retire no later than age 65.*
Description of Weighted Average Retirement Age:	Age 52.2, determined as follows: The weighted average retirement age for each participant is calculated as the sum of the product of each potential current or future retirement age times the probability of surviving from current age to that age and then retiring at that age, assuming no other decrements. The overall weighted retirement age is the average of the individual retirement ages based on all the active participants included in the June 30, 2020 actuarial valuation.
Percent Married:	85% of all active and retired firefighters are assumed to be married.
Age of Spouse:	Females are assumed to be three years younger than males, unless dates of birth are provided.
Administrative Expenses:	Administrative expenses are assumed to be $87,500, payable as of the beginning of the year.
Amortization Method:	Each year, the amortization payment is determined by subtracting the employer normal cost from the required contribution under the settlement agreement. The effective amortization period is then determined from the current unfunded actuarial accrued liability and the calculated amortization payment based on the System's funding interest rate and assuming the payment will increase 3.00% annually.
Actuarial Value of Assets:	At market value.
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary, with Normal Cost determined using the plan of benefits applicable to each participant.
Justification for Change in Actuarial Assumptions:	There have been no changes in actuarial assumptions since the last valuation.

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.

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.

Plan Year:	July 1 through June 30
Plan Status:	Closed to new entrants as of July 1, 1999
Normal Retirement:	
Eligibility	20 years of service
Amount	The annual benefit at retirement is equal to the percentage of final average salary specified in the table below. For pension purposes, final average salary is a three-year average of pay comprising base, holiday and longevity pay and up to $35,000 of overtime pay.

Years of Service	Benefit as a Percentage of Final Average Salary
20	50.0%
21	52.5
22	55.0
23	57.5
24	60.0
25	62.5
26	65.0
27	67.5
28	70.0
29	72.5
30 or more	75.0

Note: Years of service include call service.

Commencement Date	Retirement benefits commence as of the first payroll period after retirement.

Section 4: Actuarial Valuation Basis

Disability:	
Service Related	
Eligibility	Job-related mental or physical incapacity. Disability to be determined by the Town.
Amount	66 2/3% of final average salary
Non-Service Related	
Eligibility	Retirement because of a non-job-related mental or physical incapacity. Disability to be determined by the Town.
Amount	Benefit applicable under retirement or vested termination (25% of final average salary for non-vested member is minimum benefit).
Commencement Date	Benefits commence as of the first payroll period after disability
Vesting:	
Eligibility	10 years of service
Benefit Formula	25% of final average salary at termination with 10 years of service, increasing by 2.5% for each additional year of service up to a maximum of 47.5% of final average salary.
Commencement Date	Age 55
Spouse's Pre-Retirement Death Benefit:	
Eligibility	Death while actively employed
Benefit Formula	Surviving spouse (or if none, dependent children) receives 50% of final average salary (30% of final average salary for non-service related death). If surviving spouse has dependent children under age 18, additional percentages of final average salary up to a 66 2/3% benefit if service related or 50% benefit if not service related.
Retiree Cost-of-Living Increases:	Between July 1, 2017 and June 30, 2022, the COLA is suspended. Commencing July 1, 2022, the annual COLA will be 1.25% compounded annually.
Military Service Purchase:	A member may purchase up to four years of pension service credit for prior military service by contributing 10% of the member's base pay at hire at any time prior to retirement, for each year purchased.
Employee Contributions:	8% of pensionable earnings
Eligibility:	All members of the fire department hired before July 1, 1999 (members hired after this date are participants in the Rhode Island Municipal Employees Retirement System).
Optional Forms of Payment:	All single participants receive a life annuity. All married participants receive a fully subsidized 67.5% joint and survivor annuity. There are no optional forms of payment.
Employer Contributions:	The Town of Johnston adopted a policy such that the scheduled contribution is at least $3,924,554 for the fiscal year ending June 30, 2017, with this amount to be increased 3.00% annually.
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.