



City of East Providence, Rhode Island
Police and Fire Fighters Retirement System
October 31, 2019 Actuarial Valuation

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At the request of the plan sponsor, this report summarizes the City of East Providence, Rhode Island Police and Fire Fighters Retirement System as of October 31, 2019. The purpose of this report is to communicate the following results of the valuation:

- Funded Status; and
- Determine Actuarial Recommended Contribution for plan year ending October 31, 2021;

This report has been prepared in accordance with the applicable Federal and State laws. Consequently, it may not be appropriate for other purposes. Please contact Nyhart prior to disclosing this report to any other party or relying on its content for any purpose other than that explained above. Failure to do so may result in misrepresentation or misinterpretation of this report.

The results in this report were prepared using information provided to us by other parties. The census information has been provided to us by the employer. Asset information has been provided to us by the trustee. We have reviewed the provided data for reasonableness when compared to prior information provided, but have not audited the data. Where relevant data may be missing, we have made assumptions we believe to be reasonable. We are not aware of any significant issues with and have relied on the data provided. Any errors in the data provided may result in a different result than those provided in this report. A summary of the data used in the valuation is included in this report.

The actuarial assumptions and methods were chosen by the Board. In our opinion, all actuarial assumptions and methods are individually reasonable and in combination represent our best estimate of anticipated experience of the plan. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following:

- plan experience differing from that anticipated by the economic or demographic assumptions;
- changes in economic or demographic assumptions;
- increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and
- changes in plan provisions or applicable law.

We did not perform an analysis of the potential range of future measurements due to the limited scope of our engagement. This report has been prepared in accordance with generally accepted actuarial principles and practice.

Neither Nyhart nor any of its employees have any relationship with the plan or its sponsor which could impair or appear to impair the objectivity of this report. To the extent that this report or any attachment concerns tax matters, it is not intended to be used and cannot be used by a taxpayer for the purpose of avoiding penalties that may be imposed by law.

The undersigned are compliant with the continuing education requirements of the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States and are available for any questions.

Nyhart


Elizabeth A. Wiley, FSA, EA

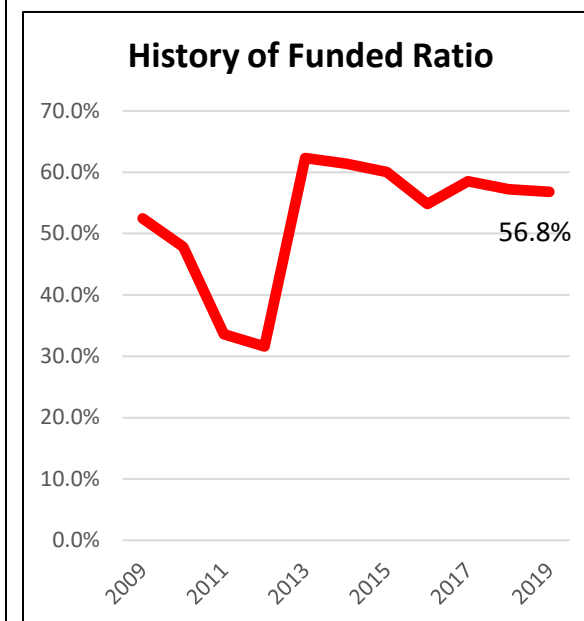
May 4, 2020
Date


Carter M. Angell, FSA, EA, MAAA

Summary Results

The actuarial valuation's primary purpose is to produce a scorecard measure displaying the funding progress of the plan toward the ultimate goal of paying benefits at retirement. The accrued liability is based on an entry age level percentage of pay.

Valuation Date For Plan Year Ending	October 31, 2018 October 31, 2020	October 31, 2019 October 31, 2021
Funded Status Measures		
Entry Age Accrued Liability	\$231,157,560	\$239,751,997
Actuarial Value of Assets	<u>\$132,323,097</u>	<u>\$136,158,048</u>
Unfunded Accrued Liability	\$98,834,463	\$103,593,949
Funded Percentage (AVA)	57.2%	56.8%
Funded percentage (MVA)	54.7%	56.3%
Cost Measures		
Actuarial Recommended Contribution	\$8,190,648	\$8,653,046
Actuarial Recommended Contribution (as a percentage of payroll)	51.7%	54.8%
Asset Performance		
Market Value of Assets (MVA)	\$126,545,967	\$134,920,201
Actuarial Value of Assets (AVA)	\$132,323,097	\$136,158,048
Actuarial Value/Market Value	104.6%	100.9%
Participant Information		
Active Participants	197	187
Terminated Vested Participants	14	3
Retirees, Beneficiaries, and Disabled Participants	<u>270</u>	<u>274</u>
Total	481	464
Valuation Payroll	\$15,270,020	\$15,219,499
Projected Payroll	\$15,842,646	\$15,790,230



Changes Since Prior Valuation and Key Notes

To better reflect anticipated experience, the mortality table for healthy lives has been updated from the RP-2014 Blue Collar mortality table with generational improvements from 2006 based on assumptions developed from the 2018 Social Security Administration Trustees Report to the RP-2014 Blue Collar mortality table with generational improvements from 2006 based on assumptions developed from the 2019 Social Security Administration Trustees Report. This change results in a decrease to the Funding Liability and a decrease in Normal Cost.

In addition, the mortality table for disabled lives has been updated from the RP-2014 Disabled mortality table with generational improvements from 2006 based on assumptions developed from the 2018 Social Security Administration Trustees Report, to the RP-2014 Disabled mortality table with generational improvements from 2006 based on assumptions developed from the 2019 Social Security Administration Trustee's Report. This change results in a decrease to the Funding Liability and a decrease in Normal Cost.

To better reflect anticipated experience, the retirement rates were updated from 20% for participants with 30 or more years of service to 30%. The retirement rates were updated based on a study of actual experience for the plan from October 31, 2007 through October 31, 2017. This change results in an increase to the Funding Liability and an increase in Normal Cost.

Historical Valuation Summary

	10/31/2015	10/31/2016	10/31/2017	10/31/2018	10/31/2019
Funding					
Accrued Liability	\$189,603,866	\$211,150,930	\$219,314,469	\$231,157,560	\$239,751,997
Actuarial Value of Assets	\$113,803,022	\$115,793,717	\$128,310,000	\$132,323,097	\$136,158,048
Unfunded Actuarial Accrued Liability	\$75,800,844	\$95,357,213	\$91,004,469	\$98,834,463	\$103,593,949
Funded Percentage	60.0%	54.8%	58.5%	57.2%	56.8%
Interest Rate	7.50%	7.50%	7.50%	7.50%	7.50%
Recommended Contribution	\$5,921,652	\$7,289,839	\$7,019,872	\$7,470,844	\$8,190,648
Actual Contribution	\$5,816,231	\$6,327,364	\$7,610,501	\$7,764,971	N/A
Rate of Return					
Market Value of Assets	1.8%	4.2%	15.1%	(0.2%)	9.6%
Demographic Information					
Active Participants	205	204	195	197	187
Terminated Vested Participants	0	0	8	14	3
Retired Participants and Beneficiaries	246	254	270	270	274
Total Participants	451	458	473	481	464
Covered Payroll	\$14,628,273	\$15,021,061	\$14,517,769	\$15,270,020	\$15,219,499
Average Covered Pay	\$71,357	\$73,633	\$74,450	\$77,513	\$81,388

Identification of Risks

The results presented in this report are shown as single point values. However, these values are derived using assumptions about future markets and demographic behavior. If actual experience deviates from our assumptions, the actual results for the plan will consequently deviate from those presented in this report. Therefore, it is critical to understand the risks facing this pension plan. The following table shows the risks we believe are most relevant to the City of East Providence, Rhode Island Police and Fire Fighters Retirement System. The risks are generally ordered with those we believe to have the most significance at the top. Also shown are possible methods by which a more detailed assessment of the risk can be performed.

Type of Risk	Method to Assess Risk
Investment Return	Scenario Testing; Asset Liability Study
Early Retirement	Scenario Testing; Review population and retirement rates
Participant Longevity	Projections and Contribution Strategy; review impact under new Public Plan Mortality tables
Salary Growth	Review salary history and future budgets; scenario testing
Demographic Risk	Scenario Testing; Stress Testing

Plan Maturity Measures – October 31, 2019

Each pension plan has a distinct life-cycle. New plans promise future benefits to active employees and then accumulate assets to pre-fund those benefits. As the plan matures, benefits are paid and the pre-funded assets begin to decumulate until ultimately, the plan pays out all benefits. A plan's maturity has a dramatic influence on how risks should be viewed. The following maturity measures illustrate where the City of East Providence, Rhode Island Police and Fire Fighters Retirement System falls in its life-cycle.

Duration of Liabilities: 12.8%

Duration is the most common measure of plan maturity. It is defined as the sensitivity of the liabilities to a change in the interest rate assumption. The metric also approximates the weighted average length of time, in years, until benefits are expected to be paid. A plan with high duration is, by definition, more sensitive to changes in interest rates. A plan with low duration is more susceptible to risk if asset performance deviates from expectations as there would be less time to make up for market losses in adverse market environments while more favorable environments could result in trapped surplus from gains. Conversely, high duration plans can often take on more risk when investing, and low duration plans are less sensitive to interest rate fluctuations.

Demographic Distribution - Ratio of Actively Accruing Participants to All Participants: 40.3%

A plan with a high ratio is more sensitive to fluctuations in salary (if a salary-based plan) and statutory changes. A plan with a low ratio is at higher risk from demographic experience. Such a plan should pay close attention to valuation assumptions as there will be less opportunity to realize future offsetting gains or losses when current experience deviates from assumptions. Plans with a low ratio also have limited opportunities to make alterations to plan design to affect future funded status.

Asset Leverage - Ratio of Payroll for Plan Participants to Market Value of Assets: 11.28%

Younger plans typically have a large payroll base from which to draw in order to fund the plan while mature plans often have a large pool of assets dedicated to providing benefits to a population primarily consisting of members no longer on payroll. Plans with low asset leverage will find it more difficult to address underfunding, as the contributions needed to make up the deficit will represent a higher percentage of payroll than for a plan with high asset leverage.

Benefit Payment Percentage - Ratio of Annual Benefit Payments to Market Value of Assets: 9.46%

As a plan enters its decumulation phase, a larger percentage of the pre-funded assets are paid out each year to retirees. A high percentage is not cause for alarm as long as the plan is nearly fully funded. However, such a plan is more sensitive to negative asset performance, especially if cash contributions are not an option to make up for losses.

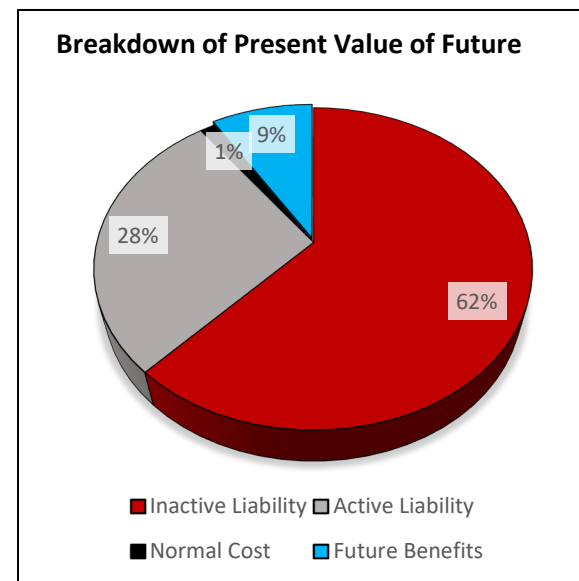
Present Value of Future Benefits

The Present Value of Future Benefits represents the future benefits payable to the existing participants.

October 31, 2019

Present Value of Future Benefits

Active participants	
Retirement	\$86,284,497
Disability	12,562,417
Death	1,159,288
Termination	1,281,088
Refund of contributions	0
Total active	\$101,287,290
Inactive participants	
Retired participants	\$125,052,789
Beneficiaries	9,395,493
Disabled participants	29,836,129
Terminated vested participants	925,288
Total inactive	\$165,209,699
Total	\$266,496,989
Present value of future payrolls	\$124,518,257



Funding Liabilities - Entry Age Normal

The Funding Liability measures the present value of benefits earned as of the valuation date, using a specified set of actuarial assumptions. It is used to determine the recommended contribution.

	October 31, 2019
Funding Liabilities	
Active participants	
Retirement	\$68,447,073
Disability	5,572,129
Death	625,111
Termination	(102,015)
Refund of contributions	0
Total Active	\$74,542,298
Inactive participants	
Retired participants	\$125,052,789
Beneficiaries	9,395,493
Disabled participants	29,836,129
Terminated vested participants	925,288
Total Inactive	\$165,209,699
Total	\$239,751,997
Normal Cost	\$3,426,846

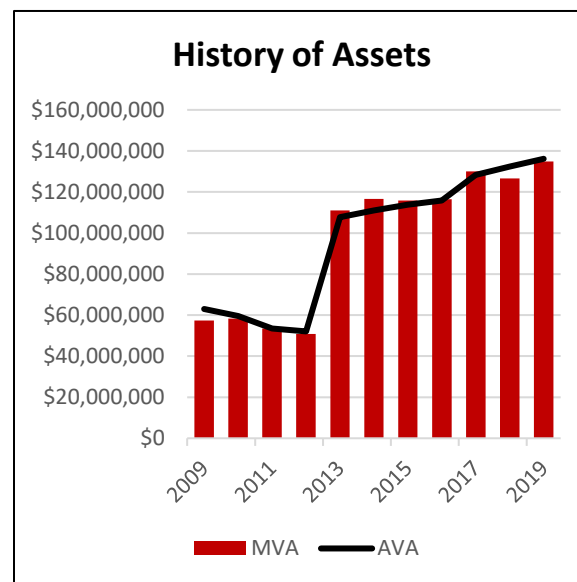
Asset Information

The amount of assets backing the pension promise is the most significant driver of volatility and future costs within a pension plan. The investment performance of the assets directly offsets the ultimate cost.

October 31, 2019

Market Value Reconciliation

Market value of assets, beginning of prior year	\$126,545,967
Contributions	
Employer contributions	\$7,764,971
Member contributions	1,439,814
Non-employer contributing entity	0
Total	\$9,204,785
Investment income	\$12,422,646
Benefit payments	(\$12,770,136)
Investment expenses	(\$404,168)
Administrative expenses	(\$78,893)
Market value of asset, beginning of current year	\$134,920,201
Return on Market Value, Net of All Expenses	9.58%
 Actuarial value of assets	
Value at beginning of current year	\$136,158,048



Asset Information (continued) – 20% Phase in

Plan Assets are used to develop funded percentages and contribution requirements.

	October 31, 2019
1. Expected market value of assets	
(a) Market value of assets, beginning of prior year	\$126,545,967
(b) Contributions	9,204,785
(c) Benefit payments	(12,770,136)
(d) Expected return	9,359,664
(e) Expected market value of assets, beginning of current year	\$132,340,280
2. Market value of assets, beginning of current year	\$134,920,201
3. Actual return on market value	\$11,939,585
4. Amount subject to phase in [(3)-(1d)]	\$2,579,921
5. Phase in of asset gain/(loss)	
(a) Current year (80% x \$2,579,921)	\$2,063,937
(b) First prior year (60% x (\$9,861,765))	(5,917,059)
(c) Second prior year (40% x \$8,648,574)	3,459,430
(d) Third prior year (20% x (\$4,220,777))	(844,155)
(e) Total phase-in	(\$1,237,847)
6. Preliminary actuarial value of assets, beginning of current year [(2) - (5e)]	\$136,158,048
7. 80% Market value of assets	\$107,936,161
8. 120% Market value of assets	\$161,904,241
9. Adjusted to actuarial value of assets due to 20% corridor	\$0
10. Final actuarial value of assets [(6) - (9)]	\$136,158,048
12. Return on actuarial value of assets	5.7%

Reconciliation of Gain/Loss

October 31, 2019

Liability (gain)/loss

Actuarial liability, beginning of prior year	\$231,157,560
Normal cost	\$3,434,977
Benefit payments	(\$12,770,136)
Expected interest	\$17,124,217
Plan Change	\$0
Change in assumptions	\$311,009
Expected actuarial liability, beginning of current year	\$239,257,627
Actual actuarial liability	\$239,751,997
Liability (gain)/loss	\$494,370

Asset (gain)/loss

Actuarial value of assets, beginning of prior year	\$132,323,097
Contributions	\$9,204,785
Benefit payments	(\$12,770,136)
Expected investment return	\$9,792,948
Change in method	\$0
Expected actuarial value of assets, beginning of current year	\$138,550,694
Actual actuarial value of assets, beginning of current year	\$136,158,048
Asset (gain)/loss	\$2,392,646

Total (gain)/loss

\$2,887,016

Development of Actuarial Recommended Contribution for Plan year Ending October 31, 2021

The actuarial recommended contribution is the annual amount necessary to fund the plan according to funding policies and/or applicable laws.

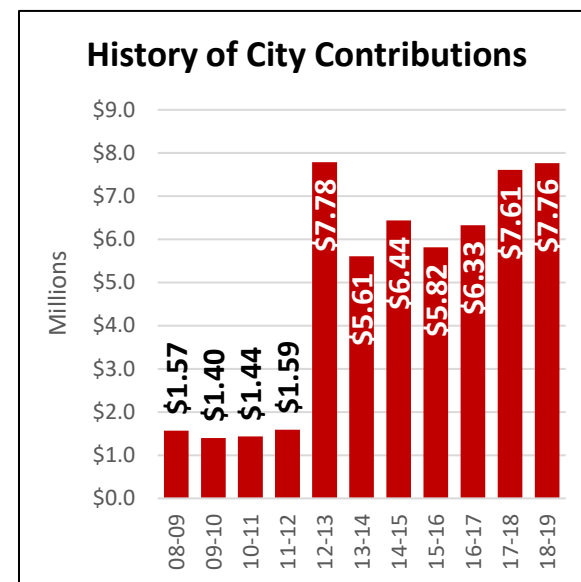
October 31, 2019

Funded Position

1. Entry age accrued liability	\$239,751,997
2. Actuarial value of assets	\$136,158,048
3. Unfunded actuarial accrued liability (UAAL)	\$103,593,949

Employer Contributions

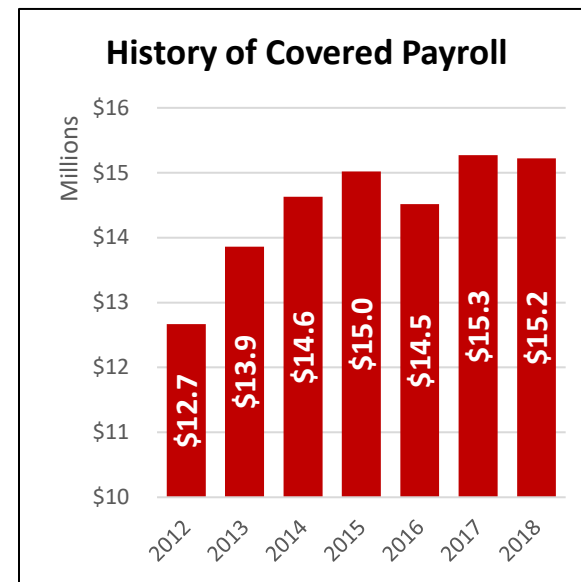
1. Normal Cost	
(a) Total normal cost	\$3,426,846
(b) Expected participant contributions	(\$1,410,612)
(c) Net normal cost	\$2,016,234
2. Amortization of UAAL	\$6,322,942
3. Calculated contribution at valuation date	\$8,339,176
4. Valuation payroll	\$15,219,499
5. Calculated contribution as a percentage of payroll (3) / (4)	54.8%
6. Projected Payroll	\$15,790,230
7. Actuarial recommended contribution (5) x (6)	\$8,653,046



Demographic Information

The foundation of a reliable actuarial report is the participant information provided by the plan sponsor. Monitoring trends in demographic information is crucial for long-term pension planning.

	October 31, 2018	October 31, 2019
Participant Counts		
Active Participants	197	187
Retired Participants	172	173
Beneficiaries	50	55
Disabled Participants	48	46
Terminated Vested Participants	14	3
Total Participants	481	464
Active Participant Demographics		
Average Age	41.1	41.7
Average Service	13.76	14.14
Average Compensation	\$77,513	\$81,388
Covered Payroll	\$15,270,020	\$15,219,499



Demographic Information (continued)

	October 31, 2018	October 31, 2019
Retiree Statistics		
Average Age	67.1	66.6
Average Monthly Benefit	\$4,261	\$4,513
Beneficiary Statistics		
Average Age	78.5	78.9
Average Monthly Benefit	\$1,813	\$1,863
Disabled Participants Statistics		
Average Age	67.4	68.0
Average Monthly Benefit	\$4,461	\$4,652
Terminated Vested Participants with Deferred Retirement Benefit Statistics		
Average Age	41.8	49
Average Monthly Benefit	\$1,989	\$2,848
Terminated Vested Participants Due a Return of Contributions Statistics		
Average Age	29.0	29.0
Total Employee Contributions	\$111,371	\$1,724
Average Employee Contributions	\$11,137	\$1,724

Participant Reconciliation

	Active	Terminated Vested	Disabled	Retired	Beneficiarie	Totals
Prior Year	197	14	48	172	50	481
Active						
To Terminated Vested	0	0	0	0	0	0
To Retired	(8)	0	0	8	0	0
To Cash-Out	(4)	0	0	0	0	(4)
To Non-Participating	0	0	0	0	0	0
To Death	(2)	0	0	0	0	(2)
Terminated Vested						
To Active	2	(2)	0	0	0	0
To Retired	0	0	0	0	0	0
To Death	0	0	0	0	0	0
To Lump Sum Cash-Out	0	(9)	0	0	0	(9)
Disabled						
To Survivor	0	0	0	0	0	0
To Death	0	0	(2)	0	0	(2)
To Retired	0	0	0	0	0	0
Retired						
To Survivor	0	0	0	0	0	0
To Disabled	0	0	0	0	0	0
To Death	0	0	0	(7)	0	(7)
Survivor						
To Death	0	0	0	0	0	0
Alternate Payees of QDRO's	0	0	0	0	0	0
Status Corrections	0	0	0	0	0	0
Additions	2	0	0	0	5	7
Departures	0	0	0	0	0	0
Current Year	187	3	46	173	55	464

Active Participant Schedule

Active participant information grouped based on age and service.

Age Group	Years of Service										Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	
Under 25		1									1
25 to 29		26	3								29
30 to 34		11	13	6							30
35 to 39		7	7	8	3						25
40 to 44		1	2	6	2	8					19
45 to 49	2	1		6	12	14	7				42
50 to 54				1	2	8	11	1			23
55 to 59			1	1		2	8	5			17
60 to 64								1			1
65 to 69											0
70 & up											0
Total	2	47	26	28	19	32	26	7	0	0	187

Name of plan

City of East Providence, Rhode Island Police and Fire Fighters Retirement System

Effective Date

November 1, 1961

Eligibility for Participation

Immediately upon becoming an employee of the police or fire department, and being sworn in as a police officer or fire fighter

Benefits

Normal Retirement

Eligibility

Police hired on or after 11/1/2014	Earlier of (i) age 50 and 25 years of service or (ii) age 60 and 10 years of service
Fire Fighters hired on or after 1/1/2014	Earlier of (i) age 55 and 25 years of service or (ii) age 60 and 10 years of service
Others	Earlier of (i) 20 years of service or (ii) age 60 and 10 years of service

Benefit

Fire Fighters retired after 11/1/1991	2.50% of Average Annual Compensation for each of the first 24 years of credited service, plus 2.0% of Average Annual Compensation for each of the next 4 years, plus 1.0% of Average Annual Compensation for each additional year of credited service to a maximum of 70% at 30 years of credited service
Fire Fighters hired on or after 1/1/2014	2.50% of Average Annual Compensation for each of the first 20 years of credited service, plus 4.0% of Average Annual Compensation for each of the next 5 years to a maximum of 70% at 25 years of credited service
Police	2.50% of Average Annual Compensation for each of the first 24 years of credited service, plus 2.0% of Average Annual Compensation for each of the next 6 years to a maximum of 72% at 30 years of credited service
Police and Fire Fighters retiring after 11/1/2008	Members will receive an additional 1.0% of Average Annual Compensation

Death – Service Related

Eligibility

Death resulting from an act of duty

Benefit

With surviving spouse, 50% of compensation at time of death, plus 10% of compensation for each child under age 18 to a maximum of 70% of compensation

Without surviving spouse, 15% of compensation at time of death for each child under the age of 18 with a maximum of 60% of compensation

Death – Non Service Related

Eligibility

3 years of service

Benefit

30% of compensation increased by 1% for each year of service in excess of 3 years, to a maximum of 50% of compensation, and beginning at the surviving spouse's age 55, plus 10% of compensation for each child under age 18 to a maximum of 60% of compensation, with benefits to spouse and children under age 18 beginning immediately.

Death – R. I. State Mandated Death Benefit

Plan benefit above, or 67.50% of final pension payment, if provides a higher benefit

Disability – Service Related

Eligibility

Active participant

Benefit

$66\frac{2}{3}$ % of compensation at time of disability plus 10% of salary for each child under age 18 to a maximum of 80% of compensation

Disability – Non Service Related

Eligibility

10 years of service

Benefit

1.75% of compensation at time of disability for each year of service to date of disability, with minimum benefit of 25% of compensation, and maximum benefit of 50% of compensation. If credited service at date of disability is twenty years or more, at age 55, participant is entitled to a service retirement annuity

Annual Compensation

Base salary, 14 days of holiday pay, plus longevity payment based on schedules below:

<u>Police Hired after 10/31/2014</u>	<u>Fire Hired on or after January 1, 2015</u>	<u>Others</u>
7% of base salary after 10 years of service	6% of base salary after 10 years of service	6% of base salary after 5 years of service
8% of base salary after 15 years of service	7% of base salary after 15 years of service	7% of base salary after 10 years of service
9% of base salary after 20 years of service	8% of base salary after 20 years of service	8% of base salary after 15 years of service
	9% of base salary after 25 years of service	9% of base salary after 20 years of service

Average Annual Compensation

Members retired on or after 11/1/1985	Final year of Annual Compensation
Police hired on or after 11/1/2014 and Fire Fighters hired on or after 1/1/2014	Average of their final 3 years' Annual Compensation

Credited Service

Completed years and months from date of hire. For any month, 15 days or more is considered a full month of service.

Employee Contributions

9% of Compensation

Fire Fighters contributions increase annually as follows	11/1/2018	9.25%
	11/1/2019	9.50%
	11/1/2020	9.75%
	11/1/2021	10.00%
Police contributions increase annually as follows	11/1/2020	9.25%
	11/1/2021	9.50%

Cost of living adjustments

Police retired between 11/1/1982 and 10/31/1983*	3.0% non-compounded increase starting on 11/1/1984
Police retired between 11/1/1983 and 10/31/1984*	3.0% non-compounded increase
Police retired between 11/1/1984 and 10/31/1991*	3.0% compounded increase at or after age 51
Police retired after 11/1/1991*	3.0% compounded increase
Police hired on or after 11/1/2014*	2.25% non-compounded increase
Fire Fighters retired between 11/1/1985 and 10/31/1989	3.0% compounded increase at or after age 51
Fire Fighters retired after 11/1/1989	3.0% compounded increase
Fire Fighters hired on or after 1/1/2014	2.25% non-compounded increase

*After 10/1/1995, annual 3% COLA extended to disabled policemen prior to age 51.

Vesting

10 years of service. Employees who terminate prior to 10 years of service receive a return of employee contributions without interest.

Normal form of payment

The normal form of benefit is a monthly benefit payable for the participant's lifetime; optional non-spouse joint and survivor annuity available on actuarial equivalent basis

Plan Provisions Not Included

We are not aware of any plan provisions not included in the valuation

Adjustments Made for Subsequent Events

We are not aware of any event following the measurement date and prior to the date of this report that would materially impact the results of this report.

Except where otherwise indicated, the following assumptions were selected by the plan sponsor with the concurrence of the actuary. Prescribed assumptions are based on the requirements of the relevant law, the Internal Revenue Code, and applicable regulation. The actuary was not able to evaluate the prescribed assumptions for reasonableness for the purpose of the measurement.

Valuation Date	October 31, 2019
Participant and Asset Information Collected as of	October 31, 2019
Cost Method (CO)	Entry Age Normal Cost Method. The Actuarial Recommended Contribution is determined as a percentage of payroll.
Amortization Method (CO)	30-year closed level % of pay amortization of the excess of the entry age actuarial accrued liability over the actuarial value of plan assets. Beginning with the October 31, 2017 Valuation and recommended contribution for plan year ending October 31, 2019, gains and losses, changes in provisions, and changes in assumptions are amortized as a closed level percent of pay over 20 years. For this purpose, pay is assumed to grow at 3.75% annually.
Asset Valuation Method	The actuarial value of assets is equal to the fair market value of assets on the valuation date adjusted for a 5-year phase in of gains and losses on fair market value of assets.
Interest Rates (CO)	7.50% This assumption has been set by the plan sponsor in conjunction with their asset advisors. Detailed evaluation of this assumption was outside the scope of our engagement.
Annual Pay Increases (FE)	4.0% compounded annually The annual pay increase is based on a study of actual experience for the plan during 1991-2014. See the experience study report dated 06/01/2015 prepared by Fallon Pension Actuaries, Inc. No change was recommended with the most recent experience study dated October 31, 2018 prepared by Nyhart.
Expense and/or Contingency Loading (FE)	None

Mortality Rates (FE)

Healthy Lives	RP-2014 Blue Collar Mortality Table with generational improvements from 2006 based on assumptions from the 2019 Social Security Administration Trustee's Report
Disabled Lives	RP-2014 Disabled Mortality Table with generational improvements from 2006 based on assumptions from the 2019 Social Security Administration Trustee's Report

As the plan is not large enough to have credible experience, mortality rates are set to reflect general population trends.

Retirement Rates (FE)

The following annual rates of retirement are reflected for participants after age 40; at age 62 and over, the annual rate of retirement is 100%.

Years of Service	Rate
20	12%
21-23	14%
24-26	16%
27-29	18%
30+	30%

The retirement rates are based on a study of actual experience for the plan during October 31, 2007 through October 31, 2017. See the experience study report dated July 31, 2018

Disability Rates (FE)

Age	Rate
25	0.50%
35	0.75%
45	1.80%
55	3.00%

50% of disability is assumed to be service-related.

The assumed disability rates are based on a study of actual experience for the plan during 1991-2014. See the experience study report dated 06/01/2015 prepared by Fallon Pension Actuaries, Inc. No change was recommended in the most recent experience study dated 7/31/2018 prepared by Nyhart.

Withdrawal Rates (FE)

<u>Years of Service</u>	<u>Rate</u>
1	4.00%
5	3.14%
10	2.07%
15	1.00%
20+	0.00%

The assumed withdrawal rates are based on a study of actual experience for the plan during 1991-2014. See the experience study report dated 06/01/2015 prepared by Fallon Pension Actuaries, Inc. No change was recommended in the most recent experience study dated 7/31/2018 prepared by Nyhart.

Marital Status and Ages (FE)

85% of participants assumed to be married with female spouses 3 years younger than husbands.

Cost of Living Adjustments

In accordance with benefit provisions of the plan, annual COLAs are assumed for the appropriate categories of members

Service-Related Death (CO)

50% of pre-retirement deaths are assumed to be service-related

Benefit Payment Timing (FE)

Payments occur at the end of the month

FE indicates an assumption representing an estimate of future experience

MD indicates an assumption representing observations of estimates inherent in market data

CO indicates an assumption representing a combination of an estimate of future experience and observations of market data

The actuarial report also shows the necessary items required for plan reporting and any state requirements.

- ✓ Schedule of Amortizations
- ✓ Schedule of Amortizations by Division
- ✓ Allocation of Assets by Division
- ✓ Actuarial Recommended Contribution by Division

Schedule of Amortizations

Total Plan

				October 31, 2019
	Total	\$103,593,949		\$6,322,942
<u>Date Established</u>	<u>Remaining Period Years</u>	<u>Outstanding Balance</u>		<u>Annual Payment</u>
10/31/2015	26	\$80,777,724		\$4,675,000
10/31/2017	18	\$12,567,699		\$928,352
10/31/2018	19	\$6,608,890		\$469,868
10/31/2019	20	\$3,639,636		\$249,722

Schedule of Amortizations by Division

Police

				October 31, 2019
	Total		\$20,065,095	\$1,308,469
<u>Date Established</u>	Remaining Period <u>Years</u>	Outstanding <u>Balance</u>		Annual <u>Payment</u>
10/31/2015	26	\$9,048,223		\$523,664
10/31/2017	18	\$3,734,353		\$275,850
10/31/2018	19	\$3,738,851		\$265,818
10/31/2019	20	\$3,543,668		\$243,137

Fire

				October 31, 2019
	Total		\$83,528,854	\$5,014,473
<u>Date Established</u>	Remaining Period <u>Years</u>	Outstanding <u>Balance</u>		Annual <u>Payment</u>
10/31/2015	26	\$71,729,501		\$4,151,336
10/31/2017	18	\$8,833,346		\$652,502
10/31/2018	19	\$2,870,039		\$204,050
10/31/2019	20	\$95,968		\$6,585

Allocation of Assets by Division

Assets are allocated between Police and Fire divisions by allocating actual employer contributions by the proportionate share of the year's anticipated employer contributions, allocating actual employee contributions by division, accounting for actual benefit payments by division, and allocating Police 60% of the year's expenses.

	<u>Police</u>	<u>Fire</u>	<u>Total</u>
Market value of assets, prior year	\$88,460,771	\$38,085,196	\$126,545,967
City contributions	\$1,893,218	\$5,871,753	\$7,764,971
Employee contributions	641,326	798,488	1,439,814
Total contributions	<u>\$2,534,544</u>	<u>\$6,670,241</u>	<u>\$9,204,785</u>
Benefit payments	(\$5,873,588)	(\$6,896,548)	(\$12,770,136)
Expenses	(\$289,837)	(\$193,224)	(\$483,061)
Investment income	\$8,644,085	\$3,778,561	\$12,422,646
Market value of assets, end of year	\$93,475,975	\$41,444,226	\$134,920,201

Development of Actuarial Recommended Contribution for Plan Year Ending October 31, 2021 by Division

	Police	Fire	Total
Funded Position			
1. Entry age accrued liability	\$114,398,680	\$125,353,317	\$239,751,997
2. Actuarial value of assets	\$94,333,585	\$41,824,463	\$136,158,048
3. Unfunded actuarial accrued liability (UAAL)	\$20,065,095	\$83,528,854	\$103,593,949
Employer Contributions			
1. Normal Cost			
(a) Total normal cost	\$1,673,672	\$1,753,174	\$3,426,846
(b) Expected participant contributions	(\$634,323)	(\$776,289)	(\$1,410,612)
(c) Net normal cost	\$1,039,349	\$976,885	\$2,016,234
2. Amortization of UAAL	\$1,308,469	\$5,014,473	\$6,322,942
3. Calculated contribution at valuation date	\$2,347,818	\$5,991,358	\$8,339,176
4. Valuation payroll	\$7,048,038	\$8,171,461	\$15,219,499
5. Calculated contribution as a percentage of payroll	33.3%	73.3%	54.8%
6. Projected Payroll	\$7,312,339	\$8,477,891	\$15,790,230
7. Preliminary actuarial recommended contribution, (5)x(6)	\$2,435,009	\$6,214,294	\$8,653,046
8. Adjustment due to rounding	1,733	2,010	-
9. Actuarial recommended contribution, (7) + (8)	\$2,436,742	\$6,216,304	\$8,653,046