



Employees' Retirement System of Jersey City

Report of the Actuary

Prepared as of January 1, 2020



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Secaucus, NJ 07096

June 12, 2020

Pension Commission
Employees' Retirement System
of Jersey City
City Hall
Jersey City, New Jersey

Members of the Pension Commission:

Section 15 of City Ordinance G-145 governing the operation of the Employees' Retirement System of Jersey City provides for actuarial valuations of the System. The results of the actuarial valuation, prepared as of January 1, 2020, are submitted in this report.

The valuation shows the financial condition of the System as of January 1, 2020 and gives a basis for determining the contributions payable by the City. On the basis of the valuation, it is recommended that the City contribute to the System 5.29% of the salaries of members as well as an accrued liability contribution of \$7,475,133 for 2020 payable as of December 31, 2020. The accrued liability contribution will increase 3% per year.

The valuation reflects the benefit and funding reforms under Chapter 282, P.L. 2013. The legislation amends Section 43:13-22.73 to decrease retirants' Cost-of-Living Adjustments from 100% to 50% of the per centum of change in the Department of Labor's Consumer Price Index. However, in accordance with the Pension Commission's administrative procedure regarding the implementation funding provision under Section 11 of the legislation, effective with the January 1, 2014 valuation, the City shall pay an additional normal cost and an additional unfunded accrued liability contribution amount which are determined to be the difference assuming future pension adjustments in the retirement allowances continue to reflect a Cost-of-Living Adjustment of 100% of the per centum of change in the Department of Labor's Consumer Price Index and the revised 50% per centum of change in the same Consumer Price Index. For 2020, the additional contribution amounts to \$2,699,154.

As required under Section 43:13-22.64 of the New Jersey Statutes, experience studies are performed once in every five-year period. This valuation was prepared on the basis of the demographic assumptions that were determined from the January 1, 2011 – December 31, 2015 Experience Study which were approved by the Pension Commission during the February 15, 2017 Pension Commission meeting. As mandated by the statute, these assumptions will remain in effect for valuation purposes until such time the Pension Commission adopts revised assumptions. The next experience study would be scheduled to review the experience of the System for the period January 1, 2016 to December 31, 2020 and any changes in assumptions would be implemented with the January 1, 2022 valuation of the System.

During the November 26, 2019 Pension Commission meeting, the following economic assumptions were adopted by the Pension Commission effective with the January 1, 2020 valuation:

- The valuation interest rate has been revised from 8.25% per annum to 7.25% per annum.
- The payroll increase rate has been reduced from 4.00% to 3.00%.
- The amortization method has been changed from 30-year open increasing amortization method to 30-year layered increasing amortization method.
- The asset valuation method has been changed from market value of assets to a five-year average of market values. The asset valuation method will be phased in over a 5-year period with the Actuarial value of assets equal to the market value of assets as of January 1, 2020.

The December 31, 2019 reporting requirements of the Governmental Accounting Standards Board Statement No. 67 are addressed in a separate report.

The City reported the individual data for members of the System as of the valuation date for use in the preparation of this report. While we did not verify the data at their source, we did perform tests for internal consistency and reasonableness. The amount of assets in the trust fund taken into account in the valuation was based on statements provided to us by the City. The accuracy of the results presented in this report is dependent on the accuracy of the data.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

This actuarial valuation was prepared under our direct supervision and we acknowledge responsibility for the results. To the best of our knowledge, the results are complete and accurate and, in our opinion, the techniques and assumptions used are reasonable and meet the funding requirements and intent of Section 43:13-22.59 of the New Jersey Statutes. There is no benefit or expense to be provided by the System and/or paid from the System’s assets for which liabilities or current costs have not been established or otherwise taken into account in the valuation. All known events or trends which may require a material increase in System costs or required contribution rates have been taken into account in the valuation.

Future actuarial measurements may differ significantly from current measurements due to System experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in System provisions or applicable law. Any statements regarding funded ratios have no specific relevance to any funded position that might be determined in the event a settlement is contemplated. An analysis of the potential range of future results is beyond the scope of this valuation.

Use of this report for any other purpose or by anyone other than the Pension Commission may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Buck should be asked to review any statement to be made on the basis of the results contained in this report. Buck will accept no liability for any such statement made without prior review by Buck.

In our opinion, the actuarial assumptions used are appropriate for purposes of the valuation and are reasonably related to the experience of the System and to reasonable long-term expectations. These assumptions were selected in accordance with applicable Actuarial Standards of Practice published by the Actuarial Standards Board.

We are Members of the American Academy of Actuaries and meet the Qualification Standards of the Academy to render the actuarial opinions contained herein. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions concerning it.

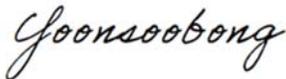
Respectfully submitted,



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Employees' Retirement System of Jersey City

Report of the Actuary

Prepared as of January 1, 2020

Section I – Summary of Principal Results

1. For convenience of reference, the principal results of the valuation and a comparison with the preceding valuation results are summarized below:

Valuation Date	1/1/2020	1/1/2018
Number of active members	758	780
Annual salaries	\$ 36,917,718	\$ 37,488,883
Number of retired members and eligible Survivors ^a	416	362
Annual retirement allowances	\$ 14,512,613	\$ 11,998,805
Number of former members entitled to vested benefits at age 60 ^b	19	22
Annual vested benefits	\$ 291,635	\$ 313,792
Market Value of Assets (MVA)	\$ 129,802,432	\$ 118,867,748
Actuarial Value of Assets (AVA)	\$ 129,802,432	N/A
Unfunded accrued liability		
– MVA Basis	\$ 123,594,387	\$ 92,349,942
– AVA Basis	\$ 123,594,387	N/A
Funded ratio		
– MVA Basis	51.2%	56.2%
– AVA Basis	51.2%	N/A
Normal contribution rate	5.29%	3.95%
Accrued liability contribution ^c	\$ 7,475,133	\$ 5,612,738
Annual Recommended Contribution	\$ 9,428,080	\$ 7,093,549
Chapter 282, P.L. 2013 Additional Contribution	2,699,154	2,029,510
Total Recommended Contribution	\$ 12,127,234	\$ 9,123,059

- a. In addition, as of January 1, 2020, there were two minor children receiving temporary pensions of \$18,251. As of January 1, 2018, there were two minor children receiving temporary pensions of \$17,922.
- b. In addition, as of January 1, 2020, there were 190 former active members who are valued for their accumulated contributions. As January 1, 2018, there were 109 former active members who are valued for their accumulated contributions.
- c. The accrued liability contribution amount is to increase 4% per year for the January 1, 2018 valuation and 3.0% per year for the January 1, 2020 valuation.

2. Comments on the valuation results as of January 1, 2020 are given in Section IV and further discussion of the contribution levels is set out in Section V.
3. A summary of the main benefit and contribution provisions of the System as interpreted for the valuation is given in Schedule C of this report. There have been no changes in the benefit provisions since the preceding valuation. The contribution provisions have changed. The amortization method and the asset valuation method have changed as outlined in Schedule B.
4. For the January 1, 2020 valuation, the interest rate used for this valuation has changed from 8.25% used for the January 1, 2018 valuation to 7.95% used for the 2019 contribution to 7.25% used for the January 1, 2020 valuation. The demographic assumptions have remained the same as the assumptions used in the prior valuation. As required under Section 43:13-22.64 of the New Jersey Statutes, experience studies are performed once in every five-year period. The valuation was prepared based on the revised demographic and economic assumptions that were determined from the January 1, 2011 – December 31, 2015 Experience Study and were approved by the Pension Commission during the February 15, 2017 Pension Commission meeting.

As a result of the changes in discount rate and amortization method, prior to recognizing the funding provisions of Chapter 282, P.L. 2013, the accrued liability increased by \$25,994,363, the gross normal cost increased by \$703,509 and the net employer contribution increased by \$2,263,206.

As mandated by the statute, these assumptions will remain in effect for valuation purposes until such time the Pension Commission adopts revised assumptions.

There were no other changes to the actuarial assumptions and methods from those used in the prior valuation. The actuarial assumptions and methods used in this valuation for valuing the System are summarized in Schedule B.

5. The valuation liabilities were determined using the Projected Unit Credit Funding Method. Under this method, the City is required to make two contributions to the System, a normal contribution and, if applicable, an accrued liability contribution. The normal contribution is defined under the Projected Unit Credit Funding Method as the present value of the benefits accruing during the current year. The unfunded accrued liability is determined as the difference between the accrued liability and the actuarial value of assets. If there was no unfunded accrued liability for the valuation period immediately preceding the current valuation period, the current year's accrued liability contribution is determined as a level percentage of pay required to liquidate the unfunded accrued liability in annual payments, increasing at 3% per year, over a 30-year closed period. Thereafter, any increase or decrease in the unfunded accrued liability as a result of actuarial losses or gains for subsequent valuation years will be amortized over a 30-year closed period increasing at 3% per year.

In accordance with the Pension Commission's administrative procedure on the funding provisions of Chapter 282, P.L. 2013, the City shall pay an additional normal cost and an additional unfunded accrued liability contribution amount assuming future Cost-of-Living Adjustments (COLA) in retirement allowances continued to be 100% of the per centum of change in the Department of Labor's Consumer Price Index (CPI).

It should be noted that employer contributions based on the statutory 30-year layered approach with increasing amortization method together with the additional Chapter 282 employer contributions may result in upward pressure on actuarially determined contribution requirements in future years.

Section II – Membership Data

1. Membership data were furnished by the System administrator.
2. Schedule D provides tables summarizing the System's membership data used for the January 1, 2020 valuation. Table 1 shows a reconciliation of the System's membership from January 1, 2018 to January 1, 2020. Tables 2 and 3 show the number and annual rates of salary of active members that

were included in the valuation, while Tables 4, 5, 6 and 7 show the number and annual pensions of retired members, eligible survivors and members entitled to vested benefits included in the valuation.

Section III – Assets

1. The amount of the assets taken into account in this valuation is based on information reported in the financial statement. The financial statement was provided by the System administrator.
2. For the January 1, 2020 valuation, the asset method used for this valuation has changed from market value of assets to a five-year average of market values. This method takes into account market value as of the valuation date reduced 80%, 60%, 40% and 20% of the gain/(loss) in each of the prior years, respectively. The gain/(loss) for each period is determined as the actual return on market value during the period less the expected return on market value based on the valuation interest rate. The resulting value is constrained to be within a corridor of 80% to 120% of market value.
3. For actuarial purposes, the five-year average of market values is equal to the market value of asset, which totaled \$129,802,432 as of January 1, 2020. The five-year average of market values will be phased-in over the next five years.

Section IV – Comments on Valuation

Schedule A of this report contains the valuation balance sheet, which shows the present and prospective assets and liabilities of the System as of January 1, 2020. The following comments on the valuation are pertinent:

1. The System has a total accrued liability of \$253,396,819 of which \$168,240,810 is for the accrued benefits payable attributable to present retired members, members entitled to receive deferred pensions and eligible survivors and \$85,156,009 is for the accrued benefits payable attributable to present active members.
2. The System has present assets of \$129,802,432. When this amount is subtracted from \$253,396,819, the total accrued liability of the System, the balance of \$123,594,387 is the unfunded accrued liability of the System.
3. The System is supported by the joint contributions of the members and the City. The expected member contributions for 2020 are \$2,444,745. When this amount is brought forward half a year with interest and subtracted from \$4,181,061, the gross normal cost of the System brought forward one year with interest, the balance of \$1,952,947 is the net normal cost payable as of December 31, 2020 by the City. This amount divided by the total annual compensation of active members of \$36,917,718 determines a net normal cost of 5.29% of salaries.
4. As mentioned above, the current valuation indicates that a normal contribution payable by the City at a rate of 5.29% of annual salaries would be required to cover the City's cost of benefit increases in the year following the valuation. This rate multiplied by the annual compensation of \$36,917,718 produces a net normal cost to be paid by the City of \$1,952,947. The accrued liability contribution is determined by amortizing the unfunded accrued liability of \$123,594,387 over 30 years with an 7.25% interest rate and increasing payments of 3% per year. The accrued liability contribution is \$7,475,133. Therefore, the total annual contribution payable by the City as of December 31, 2020, prior to Chapter 282, P.L. 2013, is \$9,428,080.
5. In accordance with the Pension Commission's administrative procedure on the funding provisions of Chapter 282, P.L. 2013, the System has a total accrued liability of \$288,075,306 and a gross normal cost of \$4,744,086 assuming continuation of the 100% COLA adjustment for future retirement allowances. The accrued liability contribution is determined by amortizing the unfunded accrued

liability of \$158,272,874 over 30 years with an 7.25% interest rate and increasing payments of 3% per year. Under Chapter 282, P.L. 2013, an additional net normal cost of \$601,759 (1.63% of salaries) and accrued liability contribution of \$2,097,395 (5.68% of salaries) are also payable as of December 31, 2020 by the City. Therefore, the total annual contribution payable by the City as of December 31, 2020 is \$12,127,234.

Section V – Contributions Required to Support the System

1. The actuarial valuation of the System indicates that a normal contribution rate of 5.29% to cover the City's cost of benefit increases in the year following the valuation and an accrued liability contribution of \$7,475,133 due to the existing unfunded accrued liability is recommended. In accordance with the Pension Commission's administrative procedure on the funding provisions under Chapter 282, P.L. 2013, an additional normal contribution rate of 1.63% and accrued liability contribution of \$2,097,395 are also payable by the City.
2. The following table summarizes the contribution recommended for payment by the City based on the salaries of members as of January 1, 2020 of \$36,917,718 and estimated salaries as of January 1, 2021 of \$38,025,250 to fund the System on a sound actuarial basis and comply with legislation.

Annual Contribution Recommended for Payment by the City

	Annual Percentage of Salaries			Annual Amount		
	Actual Cost Reflecting 50% CPI for COLA	Additional Amount to Reflect 100% CPI for COLA	Total	Actual Cost Reflecting 50% CPI for COLA	Additional Amount to Reflect 100% CPI for COLA	Total
Payable December 31, 2020 for 2020 Calendar Year						
Normal Contribution	5.29%	1.63%	6.92%	\$1,952,947	\$ 601,759	\$2,554,706
Accrued Liability Contribution	20.25%	5.68%	25.93%	\$7,475,133	\$2,097,395	\$9,572,528
Total Contribution	25.54%	7.31%	32.85%	\$9,428,080	\$2,699,154	\$12,127,234
Payable December 31, 2021 for 2021 Calendar Year						
Normal Contribution	5.29%	1.63%	6.92%	\$2,011,535	\$ 619,812	\$2,631,347
Accrued Liability Contribution	20.25%	5.68%	25.93%	\$7,699,387	\$2,160,317	\$9,859,704
Total Contribution	25.54%	7.31%	32.85%	\$9,710,922	\$2,780,129	\$12,491,051

3. As stated above, the foregoing table shows the annual contribution payable by the City on the basis of the salaries of members as of January 1, 2020 and the estimated salaries as of January 1, 2021. However, it is recommended that the actual normal contribution to be made be determined by applying the normal contribution rate of 6.92% to the actual salaries that will be paid during the period for which the contributions are to be made.

Section VI – Experience

Records are being maintained whereby the actual experience of active members, retired members and eligible survivors are compared with that expected on the basis of the tables adopted by the Pension Commission. In this way, deviations in the experience from that anticipated will be noted and any adjustments believed necessary brought to the attention of the Pension Commission.

Section VII – Actuarial Present Value of Accrued Benefits

Presented below is a comparison of the actuarial present value of accrued benefits with the market value of the assets as of the valuation date. The relevant amounts as of January 1, 2020 are:

Actuarial present value of accrued benefits:

Vested benefits	
Members and survivors currently receiving payments	\$ 164,860,000
Other members	<u>66,219,000</u>
	\$ 231,079,000
Non-vested benefits	<u>14,679,000</u>
Total	\$ 245,758,000
Assets at market value	\$ 129,802,000

The actuarial present value of vested and non-vested accrued benefits is based on an assumed interest rate of 7.25%. As of January 1, 2018, the interest rate was 8.25%.

The statement of changes in the present value of accrued benefits is as follows:

Actuarial present value benefits as of January 1, 2018	\$ 202,791,000
Increase (decrease) during the year attributable to:	
Change in actuarial assumptions	\$ 24,465,000
Benefits accumulated	11,295,000
Interest for 24 months	33,928,000
Benefits paid	<u>(26,721,000)</u>
Net Increase	\$ 42,967,000
Actual present value of accrued benefits as of January 1, 2020	\$ 245,758,000

Schedule A

Valuation Balance Sheet Showing the Actuarial Value of Assets and Liabilities of the Employees' Retirement System of Jersey City Prepared as of January 1, 2020

ASSETS		
Present assets of the System		\$ 253,396,819
	Unfunded accrued liability (surplus)	<u>123,594,387</u>
	Total Actuarial Value of Assets	<u>\$ 129,802,432</u>
 LIABILITIES 		
Present value of prospective benefits payable on account of present retired members, members entitled to receive deferred pensions and eligible survivors		\$ 168,240,810
Present value of accrued benefits payable on account of present active members:		
	Service retirement benefits	\$ 74,487,512
	Disability retirement benefits	1,737,964
	Benefits on death in service and after retirement	6,281,489
	Return of members' contributions upon withdrawal before retirement	<u>2,649,044</u>
	Total on account of active members	<u>\$ 85,156,009</u>
	Total Accrued Liabilities	<u>\$ 253,396,819</u>

Schedule B

Outline of Actuarial Assumptions and Methods

VALUATION INTEREST RATE: 7.25% per annum, compounded annually. The valuation interest rate is based on the System's asset allocation and forward-looking expected rates of return by asset category provided by the System's investment consultant.

SEPARATIONS FROM SERVICE: Representative values of the assumed annual rates of separation are as follows:

Age	Prior to Eligibility For Benefit ^a		After Eligibility For Benefit ^b		After Eligibility for Service Retirement
	Male	Female	Male	Female	
20	8.75%	6.82%			
25	8.29	6.46			
30	6.91	5.39	7.16%	5.63%	
35	4.61	3.59	4.98	3.96	
40	4.15	3.23	4.59	3.66	
45	3.69	2.87	4.19	3.36	0.53%
50	2.76	2.16	3.77	3.13	1.07
55	2.76	2.16	4.28	3.61	8.88
60					18.00
62					14.00
65					26.00
69					17.00

- a. Prior to 3 years of service, higher rates of termination are used.
- b. The differences between the rates of termination after eligibility for a benefit and those prior to eligibility of a refund of contributions are the rates assumed for members electing a deferred benefit instead.

Age	Ordinary Death ^a		Accidental Death	Ordinary Disability	Accidental Disability
	Male	Female			
20	.03%	.02%	.001%	.010%	.001%
25	.04	.02	.001	.010	.001
30	.04	.02	.001	.020	.001
35	.06	.02	.001	.030	.002
40	.10	.04	.001	.080	.007
45	.13	.06	.001	.090	.007
50	.19	.09	.001	.150	.007
55	.26	.14	.001	.350	.007
60	.40	.21	.001		.008
62	.49	.25	.001		.009
65	.65	.33	.001		.009
69	.86	.47	.001		.010

- a. Based on the RP2000 Employee Preretirement Mortality Table for male and female active participants set back 2 years for males and 7 years for females. In addition, the tables provide for future improvements in mortality from the base year of 2013 using a generational approach based on Buck Modified MP2015. Rates shown above are unadjusted for Buck Modified MP2015.

SERVICE RETIREMENT: Assumed to occur between the age first eligible and age 70.

SALARY INCREASES: Representative values of the assumed annual rates of future salary increases are as follows:

Age	Annual Rate of Salary Increase
20	4.91%
25	5.00
30	4.86
35	4.50
40	4.23
45	3.85
50	3.57
55	3.09
60	2.74
62	2.57
65	2.30
69	1.86

COST-OF-LIVING INCREASES: The COLA increase is 50% of the cumulative increase in the CPI. The CPI assumption is 2.00% per year effective January 1, 2016 and phased-in over a period of ten years to 3.00% per year effective January 1, 2026 and thereafter (i.e. increasing by 0.1% per year from January 1, 2016 through January 1, 2026).

SPOUSES: 85% of active members assumed to be married.

DEATHS AFTER RETIREMENT:

SERVICE: The RP-2000 Combined Healthy Male and Female Mortality Tables (set back 1 year for males and females) for service retirement and beneficiaries of former members and a one year static projection based on mortality improvement scale AA. In addition, the tables for service retirement provide for future improvements in mortality from the base year of 2013 using a generational approach based on the Buck Modified 2015 projection scale.

BENEFICIARIES: The RP-2000 Combined Healthy Male and Female Mortality Tables (set back 1 year for males and females) for service retirement and beneficiaries of former members and a one year static projection based on mortality improvement scale AA. In addition, the tables for beneficiaries of former members provide for future improvements in mortality from the base year of 2013 using a generational approach based on the Buck Modified 2015 projection scale.

DISABILITY: The RP-2000 Disabled Mortality Tables (set back 3 years for males and set forward 1 year for females) are used to value disabled retirees. In addition, the tables for disability retirement provide for future improvements in mortality from the base year of 2013 using a generational approach based on the Buck Modified 2015 projection scale.

Representative values of the assumed annual rates of mortality unadjusted for the Buck Modified 2015 projection scale are as follows:

Service Retirements & Beneficiaries		Disability Retirements			
Age		Age			
	Male	Female	Male	Female	
55	.31%	.24%	35	2.26%	.75%
60	.59	.44	40	2.26	.75
65	1.11	.86	45	2.26	.82
70	1.95	1.48	50	2.51	1.25
75	3.34	2.53	55	3.16	1.76
80	5.73	4.12	60	3.80	2.29
85	9.91	6.90	65	4.50	2.96

LOADING OR CONTINGENCY RESERVES: None.

VALUATION METHOD: Projected Unit Credit.

ASSET VALUATION METHOD: A five-year average of market values. This method takes into account market value as of the valuation date reduced 80%, 60%, 40% and 20% of the gain/(loss) in each of the prior years, respectively. The gain/(loss) for each period is determined as the actual return on market value during the period less the expected return on market value based on the valuation interest rate. The resulting value is constrained to be within a corridor of 80% to 120% of market value. The asset valuation is effective January 1, 2020 and will be phased-in over the next five years.

PRESENT VALUE OF ACCRUED VESTED AND NONVESTED BENEFITS: The calculation of the present value of accrued vested and non-vested benefits has been made on the basis of the same assumptions as used in the valuation except that no salary increases are assumed.

MISCELLANEOUS: The valuation was prepared on an on-going System basis. The valuation was based on members of the System as of the valuation date and did not take future members into account. No provision has been made for contingent liabilities with respect to non-vested terminated members who may be reemployed. The valuation assumptions anticipate a modest rate of future inflation. In accordance with Chapter 282, P.L. 2013 and the Pension Commission's administrative procedure, the City shall pay

an additional normal cost and an additional unfunded accrued liability contribution amount assuming the cost of the adjustment in future retirement allowances assuming 100% (instead of 50%) of the per centum of change in the Department of Labor's Consumer Price Index.

SUMMARY OF CHANGES FROM THE JANUARY 1, 2018 VALUATION:

Valuation Interest Rate

For January 1, 2018 Measurement Date: 8.25% per annum compounded annually.
For January 1, 2020 Measurement Date: 7.25% per annum, compounded annually.

Payroll Increase Rate

For January 1, 2018 Measurement Date: 4.00%
For January 1, 2020 Measurement Date: 3.00%

Amortization Method

For January 1, 2018 Measurement Date: 30-year open increasing amortization method
For January 1, 2020 Measurement Date: 30-year layered amortization with increasing payments based on the payroll increase assumption.

Asset Valuation Method

For January 1, 2018 Measurement Date: Market Value of Assets
For January 1, 2020 Measurement Date: A five-year average of market values

The change to the economic assumptions and method served to increase actuarial present value of accrued benefits and total recommended contributions.

Schedule C

Summary of Main System Provisions as Interpreted for Valuation Purposes

The Employees' Retirement System of Jersey City, which became effective February 22, 1965, was established under City Ordinance G-145 in accordance with the provisions of Chapter 275 of the Laws of New Jersey 1964. It supersedes any pension system existing in the City pursuant to Article 2, Chapter 13, Title 43 of the Revised Statutes. Legislation signed on August 19, 1996 revised the retirement and survivorship benefits payable to retirants and beneficiaries. Chapter 167, P.L. 2003 increased retirement allowances by 100% of the calculated increase in the CPI instead of the previous 60%. Chapter 247, P.L. 2005 decreased the early retirement factor from 2/12 of 1% to 1/12 of 1% per month for retirees prior to age 60. Chapter 128, P.L. 2003 allowed 39 employees to retire with enhanced benefits. Chapter 282, P.L. 2013, which was approved January 17, 2014, decreased the percentage of adjustment in the retirement allowances, pensions and survivorship benefits to 50% of the calculated increase in the CPI instead of the previous 100%.

1 – DEFINITION

"Final Salary" means the average annual salary received by a member for the three years (five years for members hired on or after January 17, 2014) immediately preceding his death or retirement or it means the average annual salary earned by a member for any 3 fiscal years (any 5 fiscal years for members hired on or after January 17, 2014) of membership providing the largest possible benefit to the member or his beneficiary; provided, however, that as to any member employed by the City prior to January 12, 1965, salary received by such member at the time of his death or retirement.

2 – MEMBERSHIP IN SYSTEM

Employees who were members of the former pension systems on the effective date automatically became members of the System. After the effective date membership is a condition of employment for those who become employees prior to the attainment of age 40. Those employees who became such prior to February 22, 1965, who were not members of a former pension system and who had become employees prior to the attainment of age 40, were allowed to join the System within 6 months after the effective date and were permitted to purchase credit for prior service. Provision was made in the ordinance for a possible transfer to the System of certain members of the State Retirement Systems within this same 6 month period. Under the provisions of Chapter 158, P.L. 1966, employees who were not covered under a former pension system and who were employed on or before February 22, 1965 and after attainment of age 40 but prior to the attainment of age 50 were allowed to become members within 6 months after the effective date of the amendment and were permitted to purchase credit for prior service. Members of the police and fire departments and employees of the board of education are not included as employees eligible to become members. All pensions and benefits on account of pensioners and beneficiaries of the former pension systems are continued under the System.

Effective October 7, 1984 temporary employees with one year's continuous service are required to become members of the System. Under the provisions of Chapter 282, P.L. 2013, effective January 17, 2014, persons employed by Jersey City under age 40 will continue membership in the State administered Public Employees' Retirement System (PERS) if they were PERS members at the time they were employed by Jersey City.

3 – BENEFITS

Retirement for Age and Service With 20 (25 years for members hired on or after January 17, 2014) or More Years of Creditable Service

Conditions for Retirement	Any member who has 20 years of creditable service in the employ of the City and has attained age 60 (25 years of creditable service and age 65 for members hired on or after January 17, 2014) may retire for age and service upon his application.
Amount of Pension	The pension payable upon retirement is equal to 55% of his final salary plus 1% of such salary for each year of creditable service in excess of 20 years (25 years for members hired on or after January 17, 2014). The minimum annual pension is \$3,600.

Retirement for Age and Service With Less Than 20 Years of Creditable Service

Conditions for Retirement	Any member who has attained age 60 but with less than 20 years of creditable service in the employ of the City may retire under this provision.
Amount of Pension	The pension payable is equal to 2% of his final salary for each year of creditable service. The annual pension, however, is never less than \$3,600.

Early Service Retirement

Conditions for Retirement	If a member resigns prior to age 60 (age 65 for members hired on or after January 17, 2014) after having completed 25 years (30 years for members hired on or after January 17, 2014) of creditable service, he may elect to receive a pension.
Amount of Pension	The pension payable is equal 55% of his final salary plus 1% of such salary for each year of service in excess of 20 years (in excess of 25 years for members hired on or after January 17, 2014), reduced by 1/12 of 1% for each month he is less than age 60 (3/12 of 1% for each month he is less than age 65 for members hired on or after January 17, 2014), but not less than \$3,600 per annum.

Termination of Service

Conditions for Pension	If a member has completed 10 years of creditable service and is separated from service either voluntarily or involuntarily prior to age 60 (age 65 for members hired on or after January 17, 2014), he may elect to receive a deferred pension commencing at age 60 (age 65 for members hired on or after January 17, 2014).
Amount of Pension	A deferred pension in an amount equal to the proportional relation which his years of service credited in the System bear to the years of service which he would have had had he continued in service to age 60 (age 65 for members hired on or after

January 17, 2014), multiplied by one-half of his final salary at the time he elected the deferred pension. The minimum annual pension is \$3,600.

Retirement for Ordinary Disability

Conditions for Retirement	Any member who has 5 or more years of creditable service and who has become permanently disabled for the further performance of his duty may be retired on a disability pension.
Amount of Pension	The pension is equal to one-half of his final salary plus 1% for each year of creditable service in excess of 20 years, never less than \$3,600 per annum.

Retirement for Accidental Disability

Conditions for Retirement	Any member who has become permanently and totally disabled, mentally or physically, for the further performance of his duty as a result of a traumatic event occurring during and as a result of the performance of his regular or assigned duties may be retired on a disability pension. The application to accomplish such retirement must be filed within five years of the original traumatic event.
Amount of Pension	The pension is equal to two-thirds of his final salary, never less than \$3,600 per annum.

Benefits Upon Death in Service

Conditions for Benefit	<p>Upon the death of a member in service who has paid to the System the full amount of his contributions, a death benefit is payable to the surviving widow, widower, minor children or dependent parents of the member, as the case may be, provided that:</p> <ul style="list-style-type: none">(a) The member dies as a result of injuries or illness received or incurred in the performance of his duties, or(b) The member has served in the employ of the City for a period of five years and dies from causes other than injuries or illness received or incurred in the performance of his duties. <p>In order to be eligible for the benefit, a widow or widower must have been married to the member at least 5 years prior to his death or retirement.</p>
Amount of Pension	The death benefit payable to the surviving widow or widower is a pension of 50% of the member's final salary. If there is no surviving widow or widower or the widow or widower dies or remarries, a pension of 20% of such final salary shall be paid to one surviving child, 35% to two surviving children in equal shares and 50% to three or more children in equal shares. If there is no surviving widow, widower or child, a pension of 25% of such final

salary shall be paid to one surviving dependent parent or 40% to two surviving dependent parents in equal shares.

If there are no eligible survivors, an amount equal to the member's contributions to the System, without interest, is payable to his estate.

Benefits upon Death after Retirement

Conditions for Benefit

Upon the death of a member after his retirement, a death benefit is payable to the surviving widow, widower, minor children or dependent parents of the member, as the case may be. In order to be eligible for the benefit, a widow or widower must have been married to the member at least 5 years prior to his retirement.

Amount of Pension

The death benefit payable to eligible survivors is a pension equal to 50% of the member's pension at retirement, not less than \$3,600 per annum.

Form of Benefits

All benefits under the System are payable for life, except that benefits to widows and widowers and dependent parents are discontinued upon their remarriage and the benefits to minor children are discontinued upon their marriage or attainment of age 18.

If after the payment of all pension and survivorship benefits payable by the System to a decedent member after retirement and his eligible survivors, the total amount paid is less than the amount of the decedent's contributions during membership in the System, the amount of the difference, without interest, shall be payable to the decedent's estate.

Refund of Contributions upon Termination of Service

A member who separates from service without receiving other benefits from the System is entitled to a refund of his contributions to the System, without interest, at the expiration of 90 days plus the period of tendency of any legal proceedings.

Cost-of-Living Adjustment

A retirant or beneficiary who has been in receipt of a pension or survivorship benefit for at least two years will receive a percentage adjustment of his initial pension or survivorship benefit at the beginning of each year starting with the year 1990, or the beginning of his 25th month in receipt of a pension or survivorship benefit, if later, equal to 50% (previously 100%) of the per centum of change in the Department of Labor's Consumer Price Index from the annual average index in 1988 or year his benefits began, if later, to the date of adjustment.

4 – CONTRIBUTIONS

By Members

Each member on the effective date of the System contributes during the entire period of his service the percentage of his salary applicable to his age at the time of his appointment, as follows:

AGE AT APPOINTMENT	% RATE OF CONTRIBUTION
Not Exceeding 35 years	6%
Between 35 and 36 years	6½
Between 36 and 37 years	7
Between 37 and 38 years	7½
Between 38 and 39 years	8
39 and over	8½

Each employee who becomes a member after the effective date of the System contributes during the entire period of his service the percentage of his salary applicable to his age at the time of becoming a member. These percentages at quinquennial ages are as follows:

AGE AT BECOMING A MEMBER	% RATE OF CONTRIBUTION
20	6.20%
25	6.60
30	7.25
35	8.15
40	9.50
45	9.70
50 and over	10.15

By City

The contributions of the City consist of a normal contribution which is the present value of benefits to be accrued in the year following the valuation converted to a percentage of the annual salaries of all active members and, until the unfunded accrued liability is liquidated, an additional amount known as the accrued liability contribution which is an amount, increasing 4% per year, that will pay off the unfunded accrued liability over a period of 30 years. In accordance with Chapter 282, P.L. 2013 and the Pension Commission's administrative procedure, effective with the January 1, 2014 valuation, the City shall pay an additional normal cost and an additional unfunded accrued liability contribution amount assuming the cost of the future adjustments in retirement allowances is 100% (instead of 50%) of the per centum of change in the Department of Labor's Consumer Price Index.

Summary of Changes From the January 1, 2018 Valuation

None.

Schedule D

Tables of Membership Data

Table 1**Reconciliation of Data from January 1, 2018 to January 1, 2020**

	Actives		Deferred Vested	Retirees		Beneficiaries	Dependents	Total
	Contrib.	Noncontrib.		Service	Disabled			
Members as of January 1, 2018	780	109	22	289	17	56	2	1,275
Status Change:								
To Contributing	0	0						
To Noncontributing	(61)	61						
Withdrawal								
- Non-Vested & Vested Refund	(40)	(17)						(57)
- Deferred Vested	(2)		2					
Service Retirement	(78)			78				
Disabled	(3)				3			
Deferred Vesteds Now Payable			(4)	4				
Death	(1)			(30)		(7)		(38)
Beneficiaries						7		7
End of Payments				(1)				(1)
New Actives	163	36						199
Rehires								
Data Corrections/pickups		1	(1)	(15)	15			
Members as of January 1, 2020	758	190	19	325	35	56	2	1,385

Table 2

The Number and Annual Rates of Salaries of Members Distributed by Fifth Year Age as of January 1, 2020

AGE	MEN		WOMEN	
	NUMBER	AMOUNT	NUMBER	AMOUNT
Under 23	8	\$ 264,340	7	\$ 167,240
23 - 27	34	1,308,295	44	1,544,793
28 - 32	45	1,847,865	64	2,769,839
33 - 37	52	2,501,295	51	2,307,145
38 - 42	46	2,182,333	94	4,340,330
43 - 47	30	1,612,513	46	2,314,137
48 - 52	23	1,463,730	43	2,157,005
53 - 57	42	2,668,156	35	1,613,748
58 - 62	28	1,814,697	36	1,950,277
63 - 67	8	697,238	11	699,908
Over 67	3	127,845	8	564,989
TOTAL	319	\$ 16,488,307	439	\$ 20,429,411

Table 3**The Number and Annual Rates of Salaries of Members Distributed by Fifth-Year Service as of January 1, 2020**

SERVICE	MEN		WOMEN	
	NUMBER	AMOUNT	NUMBER	AMOUNT
Under 3	76	\$ 2,928,677	100	\$ 4,010,797
3 - 7	83	3,842,267	96	4,045,546
8 - 12	12	530,583	21	880,529
13 - 17	46	2,565,920	90	4,232,363
18 - 22	33	2,018,548	50	2,382,772
23 - 27	23	1,430,630	36	1,820,465
28 - 32	19	1,438,865	20	1,447,529
33 - 37	20	1,268,344	13	771,939
38 - 42	5	396,903	10	602,839
Over 42	2	67,570	3	234,632
TOTAL	319	\$ 16,488,307	439	\$ 20,429,411

Table 4**The Number and Annual Pensions of Retired Members Distributed by Fifth-Year Age as of January 1, 2020**

AGE	SERVICE RETIREMENTS			
	MEN		WOMEN	
NUMBER	AMOUNT	NUMBER	AMOUNT	
Under 53	5	\$ 259,534	4	\$ 160,067
54 - 57	10	293,753	12	578,104
58 - 62	20	974,536	29	946,110
64 - 67	32	1,401,462	41	1,523,733
68 - 72	51	2,322,395	40	1,489,272
73 - 77	17	711,564	17	503,190
78 - 82	7	320,455	18	538,576
83 - 87	4	206,296	8	248,796
88 - 92	2	55,516	3	99,081
Over 92	2	43,186	3	102,983
TOTAL	150	\$ 6,588,697	175	\$ 6,189,912

Table 5**The Number and Annual Pensions of Retired Members Distributed by Fifth-Year Age as of January 1, 2020**

AGE	DISABILITY RETIREMENTS			
	MEN NUMBER	AMOUNT	WOMEN NUMBER	AMOUNT
Under 43	1	\$ 18,063		
43 - 47	1	24,098		
48 - 52			3	\$ 72,081
53 - 57	2	61,711		
58 - 62			5	103,306
63 - 67	2	48,687	4	144,337
68 - 72			3	51,817
73 - 77	4	86,304	2	40,620
78 - 82	2	49,647		
83 - 87	1	37,078	4	100,540
88 - 92	1	11,623		
Over 92				
TOTAL	14	\$ 337,211	21	\$ 512,700

Table 6**The Number and Annual Pensions of Survivors of Deceased Active and Retired Members Distributed by Fifth-Year Age as of January 1, 2020**

AGE	MEN		WOMEN	
	NUMBER	AMOUNT	NUMBER	AMOUNT
Under 53				
53 - 57			1	\$ 26,120
58 - 62	1	\$ 16,144	2	38,274
63 - 67	2	39,635	5	80,927
68 - 72	2	39,750	7	141,822
73 - 77	1	22,215	3	64,645
78 - 82			7	106,119
83 - 87	2	43,041	10	132,058
88 - 92			7	84,535
Over 92			6	48,808
TOTAL	8	\$ 160,785	48	\$ 723,308

In addition, there are 2 minor children receiving temporary pensions of \$18,251.

Table 7

The Number and Annual Deferred Pensions of Members Entitled to Vested Benefits Distributed by Fifth-Year Age as of January 1, 2020

AGE	MEN		WOMEN	
	NUMBER	AMOUNT	NUMBER	AMOUNT
Under 33				
33- 37			1	\$ 9,552
38 - 42	1	6,236		
43 - 47	2	\$ 40,502	2	43,657
48 - 52	3	41,811		
53 - 57	2	29,632	3	40,409
Over 57	3	58,936	2	20,901
TOTAL	11	\$ 177,116	8	\$ 114,519

In addition, there were 190 former active members who are valued for their accumulated contributions.

Schedule E

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions. Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. This list is not all-inclusive; it is an attempt to identify the most significant risks and how those risks might affect the results shown in this report.

- **Investment Risk**

Plan costs are very sensitive to the market return. Any lower than assumed return on assets will increase costs:

- The lower return will cause the assets to be lower than expected. This decrease in assets will increase the cost to the plan.

- **Longevity Risk**

Plan costs will be increased as participants are expected to live longer. This is because:

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- The plan also provides a cost of living increase (COLA) for retirees. If retirees live longer than expected, benefits will increase more than expected and lead to higher liabilities.
- The mortality assumption for the Plan does assume future improvement in mortality. Any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the Plan.

- **Contribution Risk**

There is a risk associated with the employer's contribution when the budgeted amount and recommended amount differ. This is because:

- When the budgeted contribution is lower than the recommended contribution the Plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with any lower than recommended contribution amounts.

- **Plan Maturity Measures:**

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired to Total Accrued Liability	January 1, 2020	January 1, 2018
1. Retirees and Beneficiaries Funding Target	164,859,921	122,331,513
2. Total Accrued Liability	253,396,819	211,217,690
3. Ratio [(1) / (2)]	65.1%	57.9%

A mature plan will often have a ratio above 60 - 65 percent. A higher percentage will generally indicate an increased need for asset / liability matching.

Ratio of Cash Flows to Assets	December 31, 2019	December 31, 2017
1. Contributions (employer and employee)	13,018,238	11,766,150
2. Benefit Payments	13,919,269	11,939,763
3. Cash Flow [(1) – (2)]	(901,031)	(173,613)
4. Market Value of Assets (without discounted value of accrued contributions)	129,802,432	118,867,748
5. Ratio [(3) / (4)]	(0.69%)	(0.15%)

When this cash flow ratio is negative more cash is being paid out than deposited in the fund. Negative cash flow means the fund needs to rely on investment returns to cover benefit payments and at the same time may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not garner the same returns as less liquid assets and therefore increase the investment risk. However, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. This maturity measure should be monitored for continual negative trend with greater magnitude.

Contribution Volatility	January 1, 2020	January 1, 2018
1. Market Value of Assets (without discounted value of accrued contributions)	129,802,432	118,867,748
2. Payroll	36,917,718	37,488,883
3. Asset Volatility Ratio (AVR) [(1) / (2)]	3.5	3.2
4. Accrued Liability	253,396,819	211,217,690
5. Accrued Liability Volatility Ratio (ALVR) [(4) / (2)]	6.9	5.6

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10 may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent the plan with a liability-to-payroll ratio of 10 may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan. In the actuary's professional judgment, the risks noted above may reasonably be anticipated to significantly affect the plan's future financial condition.