

March 20, 2019

The Board of Trustees
City of Livonia Employees Retirement System
Livonia, Michigan 48154

Dear Board Members:

The purpose of the annual actuarial valuation of the City of Livonia Employees Retirement System as of November 30, 2018, is to:

- Compute the present value of future benefits likely to be paid on behalf of current retired and active members of the Retirement System, and
- Compute the City's recommended contribution rate for the Fiscal Year beginning December 1, 2019.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices. Data concerning active members, retirees, beneficiaries and assets was provided by the City of Livonia. This data has been reviewed for reasonableness, but no attempt has been made to audit such information. The valuation was based on the provisions of the Retirement System as amended through November 30, 2018. The actuarial assumptions used in this valuation are reasonably related to the past experience of the System and represent reasonable expectations of future experience under the System. This valuation has been prepared under the supervision of a Member of the American Academy of Actuaries who meet the qualification standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



Denise M. Jones
Senior Consultant



Sandra W. Rodwan
Member, American Academy of Actuaries

***City of Livonia
Employees Retirement System***

Actuarial Valuation as of November 30, 2018

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Section One:
Valuation Summary



Purpose of Valuation

The purpose of the annual actuarial valuation of the City of Livonia Retirement System as of November 30, 2018 is to:

- ❖ Compute the present value of future benefits likely to be paid on behalf of current retired and active members of the Retirement System,
- ❖ Compute the City's recommended contribution rate for the Fiscal Year beginning December 1, 2019.

Funding Value of Assets

A smoothed market value of assets was used for the November 30, 2018, valuation. This method, which is unchanged from prior years, spreads the difference between actual and expected investment return over five years.

City's Computed Contribution Rate

The City's contribution rate for the fiscal year beginning December 1, 2019 has been computed to be 22.26% of active member payroll for the General division, 22.26% of active member payroll for the Police division, and 22.26% of active member payroll for the Fire division. These contribution rates were computed using the aggregate actuarial cost method and by applying the total contribution rate to all divisions. The aggregate actuarial cost method is appropriate for retirement systems which are closed to new hires.

The aggregate actuarial cost method produces a contribution rate for the City which, together with current assets, investment earnings and future member contributions, can be expected to accumulate to the value of the benefits payable at retirement.

The actuarial accrued liability under this method is defined to be the current actuarial value of assets.

Retirement System Experience

The overall experience of the Retirement System during the year ended November 30, 2018 was less favorable than expected based upon the long-term assumptions. The primary source of the unfavorable experience was the recognized rate of return on the smoothed funding value of assets.

There were 11 new retirees added during the year compared with 17 last year. Twenty retirees were removed compared with 22 last year.

The number of active members decreased to 71 from 79 last year. The active member payroll decreased to \$6,446,503 from \$6,682,629 last year.

Benefit Provision Changes

Police members retiring after 12/01/2017 receive additional COLA increases of \$25/month compounded for years 11-15 after retirement.

Assumption and Method Changes

None

Participant Data

| | <u>11/30/2018</u> | <u>11/30/2017</u> |
|----------------------------|-------------------|-------------------|
| Active Members | | |
| - General | 17 | 21 |
| - Police | 33 | 34 |
| - Fire | <u>21</u> | <u>24</u> |
| Total | 71 | 79 |
| Active Member Payroll | | |
| - General | \$1,111,883 | \$1,307,866 |
| - Police | 3,088,936 | 2,976,366 |
| - Fire | <u>2,245,684</u> | <u>2,398,397</u> |
| Total | \$6,446,503 | \$6,682,629 |
| Retirees and Beneficiaries | | |
| - General | 280 | 283 |
| - Police | 171 | 172 |
| - Fire | <u>104</u> | <u>105</u> |
| Total | 555* | 560** |
| Annual Pensions | | |
| - General | \$6,570,126 | \$6,507,208 |
| - Police | 6,986,811 | 6,971,394 |
| - Fire | <u>4,116,551</u> | <u>3,981,312</u> |
| Total | \$17,673,488 | \$17,459,914 |

*Includes 19 alternate payees receiving \$254,985 under eligible domestic relations orders.

** Includes 16 alternate payees receiving \$211,495 under eligible domestic relations orders.

Financial Data

| | <u>11/30/2018</u> | <u>11/30/2017</u> |
|---------------------------|-------------------|-------------------|
| Market Value of Assets | \$212,169,524 | \$231,055,993 |
| Smoothed Valuation Assets | \$220,158,032 | \$223,049,616 |

Conclusion

The Retirement System is being financed in accordance with a sound funding policy based on the aggregate actuarial cost method. The accrued funding condition of the Retirement System is good. Continuation of this condition is dependent upon future experience and receipt of contributions as required.



Section Two:

***Actuarial Calculations –
Funding***



Recommended City Contribution Rate for Fiscal Year beginning December 1, 2019

The City's computed contribution rate for the year beginning December 1, 2019 has been computed to be 22.26% of payroll for the General division, 22.26% for the Police division and 22.26% for the Fire division.

| | <u>General</u> | <u>Police</u> | <u>Fire</u> | <u>Totals</u> |
|--|------------------|------------------|------------------|--------------------|
| 1. Actuarial Present Value of all Future Benefits | | | | |
| Active Members: | | | | |
| Regular Retirement | \$ 7,528,912 | \$ 24,321,454 | \$ 16,444,712 | \$ 48,194,054 |
| Pre-Retirement death | 107,579 | 128,306 | 115,337 | 351,222 |
| Disability | 79,048 | 689,457 | 499,262 | 1,267,767 |
| Withdrawal | 87,473 | 76,524 | 30,414 | 194,411 |
| Inactive Members | 611,164 | 380,488 | 1,254,398 | 2,246,050 |
| Retirees and Beneficiaries | 58,407,946 | 74,514,211 | 41,018,649 | 173,940,806 |
| Total | 66,822,122 | 100,110,440 | 59,362,772 | 226,295,334 |
| 2. Smoothed Valuation Assets | 65,769,278 | 97,096,525 | 57,292,229 | 220,158,032 |
| 3. Present Value of Future Member Contributions | 114,767 | 517,604 | 306,754 | 939,125 |
| 4. Unfunded Present Value of Benefits: 1. – 2. – 3. | 938,077 | 2,496,311 | 1,763,789 | 5,198,177 |
| 5. Present Value of Future Pay | 4,213,791 | 11,213,296 | 7,922,846 | 23,349,933 |
| 6. City Contribution as a percent of Payroll: 4. / 5. | 22.26% | 22.26% | 22.26% | 22.26% |
| 7. City Contribution – Dollars Based on Valuation Payroll | \$247,505 | \$687,597 | \$499,889 | \$1,434,991 |

Computed Normal Cost Contribution Rates as of November 30, 2018

Based on Entry Age Actuarial Cost Method

For Illustration Purposes Only

The normal cost contribution rate based on the entry age actuarial cost method is shown for illustration purposes only and for comparison to prior years' normal costs. Last year the computed entry age normal cost for the City was 15.79% for General members, 20.70% for Police members and 19.97% for Fire members.

The aggregate actuarial cost method used to compute the City's recommended contribution rate shown on page 4 is the appropriate method for a plan closed to new hires.

| | <u>General</u> | <u>Percent of Payroll</u> | |
|-------------------------------------|----------------|---------------------------|---------------|
| | | <u>Police</u> | <u>Fire</u> |
| Normal Cost | | | |
| Regular Retirement | 13.36% | 21.40% | 19.12% |
| Pre-Retirement Death | 0.44 | 0.39 | 0.39 |
| Disability | 0.84 | 2.84 | 2.55 |
| Withdrawal | <u>3.03</u> | <u>0.97</u> | <u>.87</u> |
| Total Normal Cost | 17.67 | 25.60 | 22.93 |
| Member portion* | 3.21 | 5.10 | 4.29 |
| City's Entry Age Normal Cost | 14.46% | 20.50% | 18.64% |

*Weighted average.

Recommended and Actual City Contributions

| Valuation Date Nov. 30 | Fiscal Year Ending Nov. 30 | Recommended % of Payroll Contributions (Excluding Health after 1991) | | | Computed Dollar Contributions |
|---------------------------|----------------------------------|---|--------------|--------------|----------------------------------|
| | | General | Police | Fire | |
| 1990@ | 1992 | 13.32% | 10.00% | 23.38% | \$3,504,711 |
| 1991 | 1993 | 12.36 | 9.64 | 21.53 | 3,393,951 |
| 1992# | 1994 | 11.29 | 8.98 | 19.93 | 3,037,008 |
| 1993 | 1995 | 10.20 | 9.67 | 18.81 | 3,083,273 |
| 1994 | 1996 | 10.71 | 8.68 | 18.40 | 3,029,447 |
| 1995# | 1997 | 9.59 | 9.29 | 19.15 | 0 |
| 1995@ | 1997 | 10.78 | 10.56 | 20.73 | 3,505,876 |
| 1996# | 1998 | 10.53 | 11.62 | 20.14 | 2,798,760 |
| 1997# | 1999 | 1.48 | 10.90 | 22.32 | 0 |
| 1997@& | 1999 | 0.00 | 1.71 | 19.06 | 1,919,594 |
| 1998# | 2000 | 0.00 | 4.42 | 18.79 | 837,116 |
| 1999#@ | 2001 | 0.00 | 1.15 | 15.20 | 645,335 |
| 2000 | 2002 | 0.00 | 0.00 | 9.73 | 417,464 |
| 2001# | 2003 | 0.00 | 0.00 | 9.50 | 392,639 |
| 2002 | 2004 | 0.00 | 0.00 | 12.70 | 0 |
| 2003 | 2005 | 0.00 | 0.00 | 0.00 | 0 |
| 2004 | 2006 | 0.00 | 0.00 | 0.00 | 0 |
| 2005 | 2007 | 0.00 | 0.00 | 0.00 | 0 |
| 2006 | 2008 | 0.00 | 0.00 | 0.00 | 0 |
| 2007# | 2009 | 0.00 | 0.00 | 0.00 | 0 |
| 2008# | 2010 | 0.00 | 0.00 | 0.00 | 0 |
| 2009@ | 2011 | 0.00 | 0.00 | 0.00 | 0 |
| 2010# | 2012 | 8.98 | 3.55 | 7.49 | 829,363 |
| 2011 | 2013 | 28.42 | 12.10 | 19.81 | 2,307,296 |
| 2012 | 2015 | 45.75 | 23.71 | 50.70 | 4,132,710 |
| 2013 | 2015 | 20.07 | 17.96 | 33.10 | 2,262,146 |
| 2014 | 2016 | 0.00 | 4.23 | 22.48 | 856,625 |
| 2015@ | 2017 | 4.49 | 4.49 | 4.49 | 407,269 |
| 2016# | 2018 | 0.00 | 0.00 | 0.00 | \$0 |
| 2017@ | 2019 | 7.45 | 7.45 | 7.45 | 497,856 |
| 2018# | 2020 | 22.26 | 22.26 | 22.26 | 1,434,991 |

After changes in benefit provisions.

@ After changes in actuarial assumptions or methods.

& After removal of contribution for post-retirement health insurance benefits.

Note: Results prior to 2003 are based on reports provided by previous actuarial firm.

History of Assets and Accrued Liabilities

| Valuation Date | Valuation Assets | Actuarial Accrued Liabilities* | Funded Ratio | Unfunded Actuarial Accrued Liabilities |
|----------------|------------------|--------------------------------|--------------|--|
| 1993 | \$132,136 | \$122,975 | 107.4% | \$ (9,161) |
| 1994 | 140,037 | 130,496 | 107.3 | (9,541) |
| 1995#@ | 152,456 | 142,053 | 107.3 | (10,403) |
| 1996# | 167,361 | 151,870 | 110.2 | (15,491) |
| 1997#@ | 168,884 | 148,806 | 113.5 | (20,078) |
| 1998# | 177,035 | 151,085 | 117.2 | (25,950) |
| 1999# | 184,782 | 149,052 | 124.0 | (35,730) |
| 2000 | 192,477 | 148,670 | 129.5 | (43,807) |
| 2001# | 200,937 | 151,438 | 132.7 | (49,499) |
| 2002 | 199,627 | 159,272 | 125.3 | (40,355) |
| 2003 | 203,505 | 159,900 | 127.3 | (43,605) |
| 2004 | 199,578 | 164,378 | 121.4 | (35,200) |
| 2005 | 200,005 | 167,226 | 119.6 | (32,779) |
| 2006 | 205,101 | 169,506 | 121.0 | (35,595) |
| 2007# | 215,675 | 173,486 | 124.3 | (42,189) |
| 2008# | 210,519 | 179,096 | 117.5 | (31,423) |
| 2009@ | 207,959 | 190,134 | 109.4 | (17,925) |
| 2010# | 203,934 | 195,105 | 104.5 | (8,829) |
| 2011 | 194,515 | 196,420 | 99.0 | 1,905 |
| 2012 | 186,245 | 200,224 | 93.0 | 13,979 |
| 2013 | 197,513 | 201,390 | 98.1 | 3,877 |
| 2014 | 207,103 | 202,435 | 102.3 | (4,668) |
| 2015@ | 213,228 | 207,438 | 102.8 | (5,790) |
| 2016# | 217,503 | 210,779 | 103.2 | (6,724) |
| 2017@ | 223,050 | 219,436 | 101.7 | (3,614) |
| 2018# | 220,158 | 220,656 | 99.8 | 497 |

Results shown throughout this report, for years prior to 2003, were prepared by the previous actuarial firm.

* Based on entry age actuarial accrued liability for comparison to prior years. The entry age accrued liability has not been used to compute contribution requirements after the 1998 valuation. Under the aggregate cost method used to compute contributions beginning in 1999, the accrued liability is defined to be equal to the accrued assets.

After changes in benefit provisions.

@ After changes in actuarial assumptions or methods

The ratio of valuation assets plus future employee contributions to the total present value of future benefits was 97.7% as of November 30, 2018. This is a decrease from 99.1% in the prior year.

Comment, Recommendation and Conclusion

Comment: During the year ended November 30, 2018, retirement system experience was less favorable than expected based on the long-term assumptions. The primary source of the unfavorable experience was the rate of investment return on the smoothed market value of assets (6.7% vs. 7.5% assumed).

Recommendation: We recommend that the following transfers be made to the Reserve for Retired Benefit Payments from the Reserve for Employer Contributions so that it equals the retired life liabilities as of November 30, 2018.

| Division | Reported Reserve for Retired Benefit Payments | Computed Retiree Liabilities | Recommended Transfer from Reserve for Employer Contributions |
|-----------------|--|-------------------------------------|---|
| General | \$56,729,471 | \$58,407,946 | \$1,678,475 |
| Police | 71,582,935 | 74,514,211 | \$2,931,276 |
| Fire | 38,451,039 | 41,018,649 | \$2,567,610 |

Conclusion: The Retirement System is being financed in accordance with a sound funding policy based on the aggregate actuarial cost method. The accrued funding condition of the Retirement System is good. Continuation of this condition is dependent upon future experience and receipt of contributions as required.



Section Three:

***Retirement System
Benefit Provisions***



Benefit Provision Summary

Membership Requirements

Membership includes all persons in the classified and unclassified service of the City who perform services on a permanent part-time or full-time basis. New employees do not become members in this Retirement System.

Voluntary Retirement Eligibility

General Members: 30 years of service regardless of age, or age 55 with 10 years of service. Permanent part-time General members need only 10 calendar years of membership instead of 10 years of credited service.

Police Officers, Sergeants & Lieutenants: 25 years of service regardless of age, or age 52 with 10 years of service. (Age 50 with 10 years but less than 25 years of service early retirement with reduced benefit - benefit reduced ½% per month below age 52).

Police Chief, Deputy Chief & Captains: 27 years of service regardless of age, or age 50 with 10 years of service. (Age 48 with 10 years but less than 27 years of service early retirement with reduced benefit - benefit reduced 1/2% per month below age 50).

Fire Members: 25 years of service regardless of age (effective 10/17/16), or age 52 with 10 years of service (age 50 with 10 years of service early retirement with reduced benefit - benefit reduced ½% per month below age 52).

Normal Pension Amount

General Members: 2.5% of the member's average final compensation (AFC) times years of credited service (maximum is 75% of AFC).

Police Officers, Sergeants & Lieutenants: 2.8% of the member's average final compensation (AFC) times the first 24 years of credited service, plus 7.8% of AFC for the 25th year of credited service (maximum is 75% of AFC).

Police Chief, Deputy Chief & Captains: 2.8% of the member's average final compensation (AFC) times years of credited service (maximum is 75% of AFC).

Fire Members: 2.8% of the member's average final compensation (AFC) times years of credited service (maximum is 75% of AFC).

Average Final Compensation

The average of the highest annual compensations received during any 3 years of service contained within the 10 years of service immediately preceding retirement, including base salary, longevity, shift differential, paid time off, holiday pay, and payment of accumulated vacation time up to the limits established by the respective bargaining agreements. In addition, merit pay is included for Police members and Paramedic/EMT or ALS bonuses are included for firefighters.

Deferred Pension (Vesting)

Eligibility: Termination of City employment, other than by death or disability, prior to attaining voluntary retirement age but after completing at least 10 full years of credited service.

Amount: A monthly pension, payable beginning at voluntary retirement age (or early retirement age with a reduced benefit), computed in the same manner as a normal pension but based on credited service and AFC at time of termination of City employment.

Disability Retirement

Eligibility: Termination of City employment by reason of total and permanent disability after completing at least 10 full years of credited service, except that in the event of a duty disability the 10 year service requirement is waived.

Amount: (1) Disability incurred after age 55: A monthly pension computed in the same manner as a normal pension but based on credited service and AFC at the time of termination. (2) Disability incurred before age 55: A monthly pension computed in the same manner as a normal pension but based on AFC at time of termination and the credited service the member would have completed had employment continued until age 55, provided that in the event of a duty disability the pension payable to age 55 shall not be less than 75% of AFC. Worker’s compensation benefits are deducted. For non-duty disability cases, the following limitations apply:

| Actual Years of Service | Maximum Total Years Used to Compute Benefit | Maximum Benefit As a Percent of AFC |
|------------------------------------|--|--|
| 10-15 | 20 | 50.0% |
| 16-20 | 25 | 62.5 |
| over 20 | 30- or actual service if greater | 75.0 |

Non-Duty Death

Eligibility: Death after completing 10 years of credited service, but before termination of City employment. If member had not attained age 55 at the time of death, the death benefit shall commence at the time they would have attained voluntary retirement age. Member must either: (1) have elected Option A and named a beneficiary, or (2) leave a surviving spouse in the event Option A was not elected.

Amount: Monthly pension the beneficiary would have received had the member retired the day before death (notwithstanding that he might not have attained his voluntary retirement age) and elected the 100% joint and survivor Option A.

Duty Death

Eligibility: Death from causes arising solely and exclusively out of and in the course of a member's City employment.

Amount: Surviving spouse, or unmarried children under age 18 (if no surviving spouse), or dependent parents (if no surviving spouse or children) shall receive a monthly pension equal to the pension payable if the member had become duty disabled, elected the 100% survivor option and subsequently died. The option factor for children or parents is assumed to equal 80%. The benefit shall continue until: (a) death in the case of the widow, (b) death, marriage, adoption or attainment of age 18 in the case of the children. Worker's compensation benefits are deducted.

Employee Contributions

| | |
|---|---|
| General - Local 1917 | 3.66% of compensation. |
| - Others | 3.10% of compensation. |
| Police - LPOA | 2.55% of compensation. |
| - LLSA | 6.25% of compensation (eff. 8/24/2010) |
| | 7.30% of compensation when City contribution rate exceeds 4.18% |
| Police Chief, Deputy Chief and Captains | 5.21% of compensation. |
| Fire | 4.50% of compensation(effective 10/17/16). |

Upon voluntary, mandatory or disability retirement (or deferred retirement, in the case of General members), a member may withdraw his accumulated contributions with interest and receive an actuarially reduced lifetime benefit.

Cost-of-Living Allowance

An additional cost-of-living allowance will be paid to all retirees. The monthly amount is determined as follows:

(1) Members retired before December 1, 1979:

- (a) \$20 per month for one year period commencing one year after retirement.
- (b) \$40 per month for one year period commencing two years after retirement.
- (c) \$40 per month for one year period commencing three years after retirement.
- (d) \$60 per month for one year period commencing four years after retirement.
- (e) \$80 per month commencing five years after retirement.

(2) Members retiring on or after December 1, 1979 and before December 1, 1986:

- (a) \$20 per month for one year period commencing one year after retirement.
- (b) \$40 per month for one year period commencing two years after retirement.
- (c) \$60 per month for one year period commencing three years after retirement.
- (d) \$80 per month commencing four years after retirement.

(3) Members retiring on or after December 1, 1986:

- (a) \$20 per month for one year period commencing one year after retirement.
- (b) \$40 per month for one year period commencing two years after retirement.
- (c) \$60 per month for one year period commencing three years after retirement.
- (d) \$80 per month for one year period commencing four years after retirement.
- (e) \$100 per month for one year period commencing five years after retirement.
- (f) \$120 per month commencing six years after retirement.

(4) General members (excluding District Court), and Police Dispatchers retiring on or after December 1, 2007:

- (a) \$25 per month for one year period commencing one year after retirement.
- (b) \$50 per month for one year period commencing two years after retirement.
- (c) \$75 per month for one year period commencing three years after retirement.
- (d) \$100 per month for one year period commencing four years after retirement.
- (e) \$125 per month for one year period commencing five years after retirement.
- (f) \$150 per month for one year period commencing six years after retirement.
- (g) \$175 per month for one year period commencing seven years after retirement.
- (h) \$200 per month for one year period commencing eight years after retirement.
- (i) \$225 per month for one year period commencing nine years after retirement.
- (j) \$250 per month commencing ten years after retirement.

(5) Fire and Police members (excluding dispatchers) retiring on or after December 1, 2006 (March 20, 2006 for Fire) and before December 1, 2008:

- (a) \$20 per month for one year period commencing one year after retirement.
- (b) \$40 per month for one year period commencing two years after retirement.
- (c) \$60 per month for one year period commencing three years after retirement.
- (d) \$80 per month for one year period commencing four years after retirement.
- (e) \$100 per month for one year period commencing five years after retirement.
- (f) \$120 per month for one year period commencing six years after retirement.
- (g) \$140 per month for one year period commencing seven years after retirement.
- (h) \$160 per month for one year period commencing eight years after retirement.
- (i) \$180 per month for one year period commencing nine years after retirement.
- (j) \$200 per month commencing ten years after retirement

(6) Police and Fire members retiring on or after December 1, 2008:

- (a) \$25 per month for one year period commencing one year after retirement.
- (b) \$50 per month for one year period commencing two years after retirement.
- (c) \$75 per month for one year period commencing three years after retirement.
- (d) \$100 per month for one year period commencing four years after retirement.
- (e) \$125 per month for one year period commencing five years after retirement.
- (f) \$150 per month for one year period commencing six years after retirement.
- (g) \$175 per month for one year period commencing seven years after retirement.
- (h) \$200 per month for one year period commencing eight years after retirement.
- (i) \$225 per month for one year period commencing nine years after retirement.
- (j) \$250 per month commencing ten years after retirement

(7) Fire members retiring on or after 10/17/16, and LPOA, LLSA & Police Command on or after 12/1/2017, in addition to (6) above:

- (k) \$275 per month for one year period commencing eleven years after retirement.
- (l) \$300 per month for one year period commencing twelve years after retirement
- (m) \$325 per month for one year period commencing thirteen years after retirement.
- (n) \$325 per month for one year period commencing fourteen years after retirement.
- (o) \$375 per month commencing fifteen years after retirement.

For Police retirees retiring before December 1, 1991 and for Fire retirees retiring before December 1, 1993, the maximum increase is \$80 per month.

Section Four:

***Actuarial Assumptions
And Methods***



Actuarial Assumptions

Economic Assumptions

- (i) Interest Rate 7.5% (net of expenses)

- (ii) Salary Increases
 - Across-the-Board 4.0%
 - Merit and Longevity Age-related rates

Sample Annual Rates of Salary Increase

| Age | Across-the-Board | Merit and Longevity | Total |
|-----|------------------|---------------------|--------|
| 20 | 4.0% | 7.92% | 11.92% |
| 25 | 4.0 | 5.75 | 9.75 |
| 30 | 4.0 | 3.98 | 7.98 |
| 35 | 4.0 | 2.89 | 6.89 |
| 40 | 4.0 | 2.10 | 6.10 |
| 45 | 4.0 | 1.48 | 5.48 |
| 50 | 4.0 | 0.96 | 4.96 |
| 55 | 4.0 | 0.53 | 4.53 |
| 60 | 4.0 | 0.15 | 4.15 |
| 65 | 4.0 | 0.00 | 4.00 |

Demographic Assumptions

(i) Mortality

RP 2000 Combined Healthy
Annuitant Mortality Table
projected to 2014

| Sample Ages | Future Life Expectancy (Years) | |
|----------------|-----------------------------------|-------|
| | Men | Women |
| 55 | 27.5 | 29.6 |
| 60 | 23.0 | 25.1 |
| 65 | 18.8 | 20.8 |
| 70 | 14.9 | 16.9 |
| 75 | 11.3 | 13.3 |
| 80 | 8.3 | 10.1 |

This mortality table was first used for the November 30, 2015 valuation.

(ii) Rates of Disability

| Sample Ages | Percent Becoming Disabled Within Next Year | |
|----------------|---|-------------|
| | General | Police-Fire |
| 20 | 0.02% | 0.07% |
| 25 | 0.04 | 0.12 |
| 30 | 0.07 | 0.24 |
| 35 | 0.11 | 0.40 |
| 40 | 0.16 | 0.55 |
| 45 | 0.20 | 0.71 |
| 50 | 0.25 | 0.87 |
| 55 | 0.30 | 1.03 |

(iii) Termination of Employment

Service related rates for first 5 years of employment. Age related rates after first 5 years of employment

| Sample Ages | % of Active Members Separating Within Next Year | | |
|-------------|---|--------|------|
| | General | Police | Fire |
| 25 | 4.00 | 1.62 | 1.62 |
| 30 | 3.50 | 1.40 | 1.40 |
| 35 | 3.25 | 0.83 | 0.83 |
| 40 | 2.00 | 0.32 | 0.32 |
| 45 | 1.25 | 0.18 | 0.18 |
| 50 | 1.25 | 0.18 | 0.18 |
| 55 | 0.75 | 0.18 | 0.18 |
| 60 | 0.50 | 0.18 | 0.18 |

The rates for Police were first used for the November 30, 2015 valuation.

(iv) Retirement Rates

**Percent of Active Members Retiring within Year
Following Attainment of Indicated Retirement Age or Service**

| Retirement Ages | Age Based | | | Service Based | | |
|--------------------|-----------|--------|------|---------------|--------|------|
| | General | Police | Fire | Service | Police | Fire |
| 45 | 70% | -% | -% | 25 | 75% | 40% |
| 46 | 70 | - | - | 26 | 25 | 40 |
| 47 | 70 | - | - | 27 | 25 | 40 |
| 48 | 70 | - | - | 28 | 25 | 40 |
| 49 | 70 | - | - | 29 | 25 | 40 |
| | | | | | | |
| 50 | 70 | - | - | 30 & up | 100 | 100 |
| 51 | 70 | - | - | | | |
| 52 | 70 | 10 | 35 | | | |
| 53 | 70 | 10 | 20 | | | |
| 54 | 70 | 10 | 10 | | | |
| | | | | | | |
| 55 | 45 | 10 | 10 | | | |
| 56 | 30 | 10 | 10 | | | |
| 57 | 25 | 10 | 10 | | | |
| 58 | 25 | 10 | 10 | | | |
| 59 | 30 | 10 | 10 | | | |
| | | | | | | |
| 60 | 25 | 100 | 100 | | | |
| 61 | 25 | 100 | 100 | | | |
| 62 | 20 | 100 | 100 | | | |
| 63 | 20 | 100 | 100 | | | |
| 64 | 20 | 100 | 100 | | | |
| | | | | | | |
| 65 | 20 | 100 | 100 | | | |
| 66 | 20 | 100 | 100 | | | |
| 67 | 20 | 100 | 100 | | | |
| 68 | 20 | 100 | 100 | | | |
| 69 & up | 100 | 100 | 100 | | | |

Fire service-based rates were first used for the November 30, 2016 valuation

The other rates were first used for the November 30, 2015 valuation.

Actuarial Method Used for the Valuation

Aggregate Cost Method. This method spreads the unfunded present value of future benefits as of the valuation date over the expected future working lifetimes of the remaining active members. Characteristics of this method are as follows:

- ❖ The aggregate annual normal costs payable from the valuation date to the group's projected dates of retirement, disability or death are expected to accumulate to the actuarial present value of the group's benefit at date of retirement, disability or death.

- ❖ By definition, the accrued liability is equal to the actuarial funding value of assets.



Section Five:
Valuation Data



Summary of Asset Information Submitted for the Valuation

Statement of Assets

As of November 30, 2018, the market value of Retirement System assets was reported to be \$212,169,524.

Revenues and Expenses for the Year Ended November 30, 2018:

| | |
|---|----------------|
| (a) Revenues | |
| (i) Member Contributions | \$ 308,076 |
| (ii) Employer Contributions | 558,568 |
| (iii) Investment Income (Net of Expenses) | (1,636,196) |
| (iv) Other income | <u>0</u> |
| (v) Total Income | (769,552) |
| | |
| b. Expenses | |
| (i) Pensions | 17,484,418 |
| (ii) Refunds and annuity withdrawal | 401,899 |
| (iii) Other | 12,566 |
| (iv) Legal Expense | 43,060 |
| (v) Admin | <u>174,974</u> |
| Total Expenses | \$18,116,917 |

Investment Allocation

The reported asset allocation at market value was as follows:

| | |
|---|---------------|
| a. Cash and Short Term | |
| (i) Cash (incl. Checking/Savings Accounts) | \$145,763 |
| (ii) Accruals and Receivables | 310,144 |
| (iii) Contributions Receivable | 134,406 |
| (iv) Other Receivables, Pending Trades | 70,356 |
| (v) Money Market Funds | 0 |
| (vi) Treasury Bills | - |
| (vii) Short Term Investments | 3,127,172 |
| b. Fixed Income | |
| (i) U.S. Government/Agency Bond | 3,372,078 |
| (ii) Corporate Bonds | 10,735,608 |
| (iii) Asset Backed Securities | 1,847,723 |
| (iv) Private Placements | 270,626 |
| (v) Municipal Obligations | - |
| (vi) Mortgage Backed Securities | 7,358,923 |
| (vii) TBA | - |
| (viii) Collateralized Mortgage Obligations | 4,061,079 |
| (ix) Other: Foreign Bonds & Notes | 1,934,230 |
| (x) Fixed Income mutual funds | 26,112,538 |
| c. Equities | |
| (i) Common Stock | 75,786,992 |
| (ii) Closely held equity | 6,232,958 |
| (iii) Open End mutual funds | 27,045,353 |
| (iii) Other: Foreign | 4,082,556 |
| American Depository Receipts | 6,294,140 |
| General Growth RTS | 8,457,566 |
| d. Real Estate: | |
| (i) Real estate investment funds | 2,151,187 |
| (ii) Other | 23,048,288 |
| e. Other Assets: | 132,768 |
| f. Less accounts payable | (542,931) |
| g. Total Market Value of Assets as of November 30, 2018 | \$212,169,524 |

Funding Value of Assets

| | Year Ended 11/30/2017 | Year Ended 11/30/2018 |
|--|----------------------------------|----------------------------------|
| A. Funding Value Beginning of Year | \$217,502,699 | \$223,049,616 |
| B. Market Value End of Year | 231,055,993 | 212,169,524 |
| C. Market Value Beginning of Year | 213,725,349 | 231,055,993 |
| D. Non-Investment Income Net Cash Flow | (17,577,595) | (17,250,273) |
| E. Investment Income | | |
| E1. Market Total B-C-D | 34,908,239 | (1,636,196) |
| E2. Amount for Immediate Recognition | 16,697,112 | 16,081,836 |
| E3. Amount for Phased-In Recognition E1 – E2 | 18,211,127 | (17,718,032) |
| F. Phased-In Recognition of Investment Income | | |
| F1. From the Current Year 0.20 x E3 | 3,642,225 | (3,543,606) |
| F2. First Prior Year | (472,847) | 3,642,225 |
| F3. Second Prior Year | (2,331,758) | (472,847) |
| F4. Third Prior Year | 982,839 | (2,331,758) |
| F5. Fourth Prior Year | 4,606,941 | 982,839 |
| F6. Total Recognized Investment Gain | 6,427,400 | (1,723,147) |
| G. Gross Funding Value end of Year A + D + E2 + F6 | 223,049,616 | 220,158,032 |
| H. Health Insurance Reserve | 0 | 0 |
| I. Net Funding Value | 223,049,616 | 220,158,032 |
| J. Difference Between Market and Funding Value | 8,006,377 | (7,988,508) |
| K. Market Rate of Return | 15.1% | (0.7)% |
| L. Recognized Rate of Return | 11.1% | 6.7% |

Reported Reserve Balances

| | <u>11/30/2017</u> | <u>11/30/2018</u> |
|--------------------------------------|--------------------------|--------------------------|
| Reserve for Employees' Contributions | \$5,729,766 | \$5,579,190 |
| Reserve for Employer Contributions | 64,829,607 | 39,826,889 |
| Reserve for Retired Benefit Payments | 160,496,620 | 166,763,445 |
| Reserve for Health Insurance | <u>0</u> | <u>0</u> |
| Total | \$231,055,993 | \$212,169,524 |

Participant Summary

Retirees and Beneficiaries Included in the Valuation

There were 555 retirees and beneficiaries included in the valuation, with annual pensions totaling \$17,673,488. There were 11 new retirees added during the year and 20 were removed.

Pensions Being Paid

| Valuation Date | No. | Annual Pensions | % of Active Payroll | Average Pension | Discounted Value of Pensions | |
|----------------|------------|-------------------|---------------------|-----------------|------------------------------|----------------|
| | | | | | Total | Average |
| 1988 | 308 | \$3,586,869 | 18.3% | \$11,646 | \$37,993,837 | \$123,357 |
| 1989 | 331 | 4,122,475 | 19.8 | 12,455 | 43,437,508 | 131,231 |
| 1990 | 344 | 4,426,535 | 19.8 | 12,868 | 43,526,995 | 126,532 |
| 1991 | 362 | 4,941,277 | 21.6 | 13,650 | 48,403,086 | 133,710 |
| 1992 | 388 | 5,487,251 | 23.0 | 14,142 | 52,852,822 | 136,219 |
| 1993 | 396 | 5,795,349 | 24.1 | 14,635 | 56,746,560 | 143,299 |
| 1994 | 416 | 6,466,603 | 25.3 | 15,545 | 63,150,428 | 151,804 |
| 1995 | 433 | 6,915,782 | 27.1 | 15,972 | 66,978,476 | 154,685 |
| 1996 | 450 | 7,503,958 | 26.8 | 16,675 | 72,267,650 | 160,595 |
| 1997 | 468 | 8,030,733 | 39.0 | 17,161 | 76,656,612 | 163,796 |
| 1998 | 483 | 8,444,938 | 40.9 | 17,484 | 80,195,707 | 166,037 |
| 1999 | 493 | 8,948,784 | 47.9 | 18,152 | 84,683,874 | 171,773 |
| 2000 | 502 | 9,357,146 | 54.6 | 18,640 | 88,078,816 | 175,456 |
| 2001 | 515 | 9,671,679 | 57.8 | 18,780 | 90,253,559 | 175,250 |
| 2002 | 519 | 9,961,049 | 57.6 | 19,193 | 92,404,782 | 178,044 |
| 2003 | 524 | 10,308,740 | 60.3 | 19,673 | 95,345,963 | 181,958 |
| 2004 | 538 | 10,967,097 | 68.2 | 20,385 | 101,737,860 | 189,104 |
| 2005 | 536 | 11,135,810 | 70.1 | 20,776 | 102,438,312 | 191,116 |
| 2006 | 542 | 11,462,445 | 71.0 | 21,148 | 104,737,223 | 193,242 |
| 2007 | 547 | 11,812,063 | 75.4 | 21,594 | 107,405,977 | 196,355 |
| 2008 | 546 | 11,981,932 | 74.6 | 21,945 | 107,771,201 | 197,383 |
| 2009 | 546 | 12,170,553 | 76.8 | 22,290 | 110,805,883 | 202,941 |
| 2010 | 562 | 13,369,294 | 96.9 | 23,789 | 122,739,076 | 218,397 |
| 2011 | 567 | 14,273,423 | 114.6 | 25,174 | 129,949,005 | 229,187 |
| 2012 | 567 | 14,936,507 | 132.4 | 26,343 | 138,322,423 | 243,955 |
| 2013 | 576 | 15,699,372 | 159.1 | 27,256 | 146,096,118 | 253,639 |
| 2014 | 572 | 15,977,582 | 171.6 | 27,933 | 148,202,133 | 259,095 |
| 2015 | 562 | 15,956,709 | 175.9 | 28,392 | 150,123,905 | 267,124 |
| 2016 | 569 | 16,904,555 | 221.7 | 29,709 | 161,017,061 | 282,983 |
| 2017 | 560 | 17,459,914 | 261.3 | 31,178 | 172,141,780 | 307,396 |
| 2018 | 555 | 17,673,488 | 274.2 | 31,844 | 173,940,806 | 313,407 |

Retirees and Beneficiaries - November 30, 2018

| Attained Age | General | | Police | | Fire | | Totals | |
|-----------------|------------|--------------------|------------|---------------------|------------|--------------------|------------|---------------------|
| | No. | Annual Pensions | No. | Annual Pensions | No. | Annual Pensions | No. | Annual Pensions |
| 45-49 | | | 5 | \$305,378 | | | | \$305,378 |
| 50-54 | 2 | 88,008 | 39 | 2,031,085 | 7 | 513,138 | 48 | 2,632,231 |
| 55-59 | 28 | 851,856 | 35 | 1,809,250 | 13 | 774,154 | 76 | 3,435,260 |
| 60-64 | 36 | 1,275,487 | 9 | 387,911 | 15 | 843,353 | 60 | 2,506,751 |
| 65-69 | 39 | 1,056,368 | 14 | 335,242 | 13 | 606,463 | 66 | 1,998,073 |
| 70-74 | 51 | 1,300,363 | 20 | 704,533 | 12 | 452,640 | 83 | 2,457,536 |
| 75-79 | 30 | 537,911 | 29 | 855,908 | 18 | 485,725 | 77 | 1,879,544 |
| 80-84 | 34 | 619,548 | 15 | 438,835 | 11 | 198,127 | 60 | 1,256,510 |
| 85-89 | 37 | 557,513 | 4 | 96,450 | 9 | 165,762 | 50 | 819,725 |
| 90-94 | 17 | 203,797 | 1 | 22,219 | 4 | 44,572 | 22 | 270,588 |
| 95-99 | 6 | 79,275 | | | 2 | 32,617 | 8 | 111,892 |
| Totals | 280 | \$6,570,126 | 171 | \$ 6,986,811 | 104 | \$4,116,551 | 555 | \$17,673,488 |

There were 13 inactive vested members with estimated annual benefits of \$224,683 included in the valuation.

**Inactive Vested Members
November 30, 2018**

| <u>Attained Age</u> | <u>General</u> | | <u>Police</u> | | <u>Fire</u> | | <u>Total</u> | |
|---------------------|----------------|----------------------------------|---------------|----------------------------------|-------------|----------------------------------|--------------|----------------------------------|
| | <u>No.</u> | <u>Estimated Annual Pensions</u> | <u>No.</u> | <u>Estimated Annual Pensions</u> | <u>No.</u> | <u>Estimated Annual Pensions</u> | <u>No.</u> | <u>Estimated Annual Pensions</u> |
| 45-49 | 1 | \$5,039 | 1 | \$35,945 | 1 | \$37,974 | 3 | \$78,958 |
| 50-54 | 4 | 37,666 | | | 1 | 75,580 | 5 | 113,246 |
| 55-59 | 2 | 16,857 | | | | | 2 | 16,857 |
| 60-64 | | | 1 | 5,822 | | | 1 | 5,822 |
| 75-79 | | | 1 | 7,000 | | | 1 | 7,000 |
| 100-104 | 1 | 2,800 | | | | | 1 | 2,800 |
| Totals | 8 | \$62,362 | 3 | \$48,767 | 2 | \$113,554 | 13 | \$224,683 |

Total Active Members - November 30, 2018
Age and Service Distribution

| Attained Age | Service | | | | No. | Totals | |
|-------------------------|----------------|--------------|--------------|--------------|------------|--------------------|--|
| | 15-19 | 20-24 | 25-29 | 30-34 | | Payroll | |
| 40-44 | | 9 | | | 9 | \$903,046 | |
| 45-49 | | 28 | 4 | | 32 | 3,026,576 | |
| 50-54 | | 7 | 7 | 3 | 17 | 1,549,829 | |
| 55-59 | | 4 | 4 | 1 | 9 | 682,206 | |
| 60-64 | | | | 1 | 1 | 71,511 | |
| 65-69 | | 1 | 2 | | 3 | 213,335 | |
| Total | | 49 | 17 | 5 | 71 | \$6,446,503 | |

Group Averages:

Age: 50.8 years
 Service: 24.3 years
 Annual Pay: \$90,796

**General Active Members - November 30, 2018
Age and Service Distribution**

| Attained Age | Service | | | | No. | Totals Payroll |
|-------------------------|----------------|--------------|--------------|--------------|------------|---------------------------|
| | 15-19 | 20-24 | 25-29 | 30-34 | | |
| 45-49 | | 2 | 1 | | 3 | \$185,518 |
| 50-54 | | 1 | 2 | 2 | 5 | 334,397 |
| 55-59 | | | 4 | 1 | 5 | 307,122 |
| 60-64 | | | | 1 | 1 | 71,511 |
| 65-69 | | 1 | 2 | | 3 | 213,335 |
| Total | | 4 | 9 | 4 | 17 | \$1,111,883 |

Group Averages:

Age: 56.3 years
 Service: 27.1 years
 Annual Pay: \$65,405

**Police Active Members - November 30, 2018
Age and Service Distribution**

| Attained Age | | | | Totals | |
|-------------------------|--------------|--------------|--------------|---------------|--------------------|
| | 20-24 | 25-29 | 30-34 | No. | Payroll |
| 40-44 | 8 | | | 8 | \$770,018 |
| 45-49 | 16 | 2 | | 18 | 1,677,835 |
| 50-54 | 2 | 2 | 1 | 5 | 473,753 |
| 55-59 | <u>2</u> | | | <u>2</u> | <u>167,330</u> |
| Total | 28 | 4 | 1 | 33 | \$3,088,936 |

Group Averages:

Age: 48.1 years
 Service: 23.4 years
 Annual Pay: \$93,604

**Fire Active Members - November 30, 2018
Age and Service Distribution**

| Attained Age | | | | Totals |
|-------------------------|--------------|--------------|------------|--------------------|
| | 20-24 | 25-29 | No. | Payroll |
| 40-44 | 1 | | 1 | \$133,028 |
| 45-49 | 10 | 1 | 11 | 1,163,223 |
| 50-54 | 4 | 3 | 7 | 741,679 |
| 55-59 | <u>2</u> | | <u>2</u> | <u>207,754</u> |
| Total | 17 | 4 | 21 | \$2,245,684 |

Group Averages:

Age: 50.4 years
Service: 23.5 years
Annual Pay: \$106,937

Active Members – Three Year Comparison

| | November 30, | | |
|------------------------|---------------------|-------------|-------------|
| | 2018 | 2017 | 2016 |
| Active Members | 71 | 79 | 95 |
| Average Age (yrs.) | 50.8 | 49.7 | 50.1 |
| Average Service (yrs.) | 24.3 | 23.7 | 23.5 |
| Average Pay | \$90,796 | \$84,590 | \$80,273 |

Active Members by Division – November 30, 2018

| Valuation Division | No. | Annual Payroll | Average Age | Average Service | Average Pay |
|--------------------|-----------|--------------------|-------------|-----------------|-----------------|
| General - Court | 0 | \$0 | 0.0 | 0.0 | \$0 |
| - Dispatchers | 1 | 66,450 | 49.2 | 22.2 | 66,450 |
| - Local 192 – FT | 9 | 533,863 | 26.5 | 26.5 | 59,318 |
| - Local 1917 | 3 | 214,278 | 54.9 | 30.1 | 71,426 |
| - Other | <u>4</u> | <u>297,292</u> | 61.9 | 27.4 | 74,323 |
| Total | 17 | \$1,111,883 | 56.3 | 27.1 | \$65,405 |
| Police – LPOA | 15 | \$1,262,148 | 48.8 | 22.9 | \$84,143 |
| - Lts. & Sgts. | <u>18</u> | <u>1,826,788</u> | 47.6 | 23.9 | 101,488 |
| Total | 33 | \$3,088,936 | 48.1 | 23.4 | \$93,604 |
| Fire – 56 Hours | 17 | \$1,758,526 | 50.7 | 23.3 | \$103,443 |
| - 40 Hours | 2 | 223,705 | 51.9 | 23.9 | 111,852 |
| - Administration | <u>2</u> | <u>263,453</u> | 46.7 | 25.5 | <u>131,727</u> |
| Total | 21 | \$2,245,684 | 50.4 | 23.5 | \$106,937 |
| Totals | 71 | \$6,446,503 | 50.8 | 24.3 | \$90,796 |