# ATTACHMENT B:
# PFRS ACTUARY VALUATION REPORT
# AS OF JULY 1, 2018

CHEIRON Classic Values, Innovative Advice

# Oakland Police and Fire Retirement System

## Actuarial Valuation Report as of July 1, 2018

**Produced by Cheiron**

**February 2019**

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February 15, 2019

City of Oakland Police and Fire
Retirement System Board
150 Frank H. Ogawa Plaza
Oakland, CA 94612

Dear Members of the Board:

At your request, we have conducted an actuarial valuation of the Oakland Police and Fire Retirement System (PFRS, the Plan) as of July 1, 2018. This report contains information on the Plan's assets and liabilities. This report also discloses the employer contributions in accordance with the funding agreement between the City of Oakland and PFRS, based on the current financial status of the Plan. Your attention is called to the Foreword in which we refer to the general approach employed in the preparation of this report.

The purpose of this report is to present the results of the annual actuarial valuation of the Plan. This report is for the use of the Retirement Board and the auditors in preparing financial reports in accordance with applicable law and accounting requirements. Any other user of this report is not an intended user and is considered a third party.

Cheiron's report was prepared solely for the Retirement Board for the purposes described herein, except that the plan auditor may rely on this report solely for the purpose of completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

Sincerely,
Cheiron

Graham A. Schmidt, ASA, EA, FCA, MAAA
Consulting Actuary

Timothy S. Doyle, ASA, EA, MAAA
Associate Actuary

# FOREWORD

Cheiron has performed the actuarial valuation of the Oakland Police and Fire Retirement System (PFRS, the Plan) as of July 1, 2018. The valuation is organized as follows:

- In Section I, the **Executive Summary,** we describe the purpose of an actuarial valuation, summarize the key results found in this valuation, and disclose important trends.

- The **Main Body** of the report presents details on the Plan's

    - Section II – Assets
    - Section III – Liabilities
    - Section IV – Contributions
    - Section V – Head Count and Benefit Payment Projections

- In the **Appendices**, we conclude our report with detailed information describing plan membership (Appendix A), actuarial assumptions and methods employed in the valuation (Appendix B), a summary of pertinent plan provisions (Appendix C), and a glossary of key actuarial terms (Appendix D).

The results of this report rely on future plan experience conforming to the underlying assumptions. To the extent that actual plan experience deviates from the underlying assumptions, the results would vary accordingly.

In preparing our report, we relied on information (some oral and some written) supplied by the Plan's staff. This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

# SECTION I – EXECUTIVE SUMMARY

The primary purpose of the actuarial valuation and this report is to measure, describe, and identify the following as of the valuation date:

- The financial condition of the Plan,
- Past and expected trends in the financial progress of the Plan, and
- Calculation of the actuarially determined contributions for years beginning in Fiscal Year 2019-2020.

In the balance of this Executive Summary, we present (A) the basis upon which this year's valuation was completed, (B) the key findings of this valuation including a summary of all key financial results, (C) an examination of the historical trends, and (D) the projected financial outlook for the Plan.

## A. Valuation Basis

This valuation estimates the projected employer contributions in accordance with the funding agreement dated July 1, 2012 between the City of Oakland and the PFRS. Based on that agreement, employer contributions were suspended until fiscal year 2017-2018, at which time they resumed at a level based upon the recommendation of the actuary. Section IV of this report shows the development of the employer contribution for fiscal year 2019-2020.

The Plan's funding policy is to contribute an amount equal to the sum of:

- The normal cost under the Entry Age Normal Cost Method (which is zero, as there are no active members),
- Amortization of the Unfunded Actuarial Liability, and
- The Plan's expected administrative expenses.

This valuation was prepared based on the plan provisions shown in Appendix C. There have been no changes in plan provisions since the prior valuation.

A summary of the assumptions and methods used in the current valuation is shown in Appendix B. New Memorandums of Understanding (MOUs) went into effect for both Police and Fire members since the previous valuation, changing Police and Fire retirees' Cost-of-Living Adjustments (COLAs), and adding a benefit based on Longevity Pay to Fire benefits. There have been no other changes to the assumptions or methods since the prior valuation.

## B. Key Findings of this Valuation

The key results of the July 1, 2018 actuarial valuation are as follows:

- The actuarially determined employer contribution amount for Fiscal Year 2019-2020 is $43.4 million, based on projecting the Actuarial Liabilities and the Actuarial Value of Assets to the end of the 2018-2019 Fiscal Year. This represents a decrease of $2.3 million from the amount determined in the prior valuation for the same Fiscal Year. The contribution is assumed to be paid in equal installments throughout the year, or on average at approximately January 1, 2020.

- New Memorandums of Understanding (MOUs) went into effect for Police members between the previous and current valuation dates, changing Police retirees' Cost-of-Living Adjustments (COLAs). The change in COLAs from the new Police MOUs lowered the liability by $6.4 million since the scheduled increases under the new MOUs were lower than the amounts originally assumed, in aggregate.

- New Memorandums of Understanding (MOUs) went into effect for Fire members between the previous and current valuation dates, changing Fire retirees' Cost-of-Living Adjustments (COLAs) and granting Longevity Pay to Fire retirees. The change in COLAs from the new Fire MOUs increased the liability by $3.4 million since the scheduled increases under the new MOUs were higher than the amounts originally assumed, in aggregate. Longevity Pay increased the liability by about $1.5 million.

- During the year ended June 30, 2018, the return on Plan assets was 10.22% on a market value basis net of investment expenses, as compared to the 6.00% assumption for the 2017-2018 Plan year. This resulted in a market value gain on investments of $13.3 million. The Actuarial Value of Assets (AVA) is calculated as the expected AVA plus 20% of the difference between the market value and the expected AVA. This smoothed value of assets returned 8.18%, for an actuarial asset gain of $7.1 million.

- The Plan experienced a gain on the Actuarial Liability of $7.5 million, the net result of changes in the population, in particular more deaths than expected among disabled retirees and beneficiaries. Combining the liability losses and asset gains, the Plan experienced a total gain of $14.6 million.

- The Plan's smoothed funded ratio, the ratio of actuarial assets over Actuarial Liability, increased from 49.5% last year to 53.7% on an AVA basis as of June 30, 2018.

- The Plan's funded ratio increased from 52.4% to 58.1% on a Market Value of Assets (MVA) basis.

- The Unfunded Actuarial Liability (UAL) is the excess of the Plan's Actuarial Liability over the Actuarial Value of Assets. The Plan experienced a decrease in the UAL from $340.1 million to $299.8 million as of July 1, 2018.

## SECTION I – EXECUTIVE SUMMARY

- Overall participant membership decreased compared to last year. 41 members died, 19 of whom had their benefits continue to a surviving spouse. In addition, 27 surviving beneficiaries died. There are no active members of the Plan.

- If the contribution were determined using a projected asset value based on the current market (i.e., non-smoothed) value of assets, the contribution for FY 2019-2020 would be $39.6 million. The contribution is smaller than that determined using the projected AVA, because the current market value reflects the full amount of recent investment gains, while under the AVA projection a portion of those gains are deferred until years after FY 2019-2020.

Below we present Table I-1 that summarizes all the key results of the valuation with respect to membership, assets and liabilities, and contributions. The results are presented and compared for both the current and prior plan year.

**TABLE I-1**
**Summary of Principal Plan Results**
**($ in thousands)**

| | July 1, 2017 | July 1, 2018 | % Change |
|---|---|---|---|
| **Participant Counts** | | | |
| Active Participants | 0 | 0 | |
| Participants Receiving a Benefit | 886 | 837 | -5.53% |
| **Total** | **886** | **837** | **-5.53%** |
| Annual Pay of Active Members | $ 0 | $ 0 | |
| **Assets and Liabilities** | | | |
| Actuarial Liability (AL) | $ 673,441 | $ 647,251 | -3.89% |
| Actuarial Value of Assets (AVA) | 333,373 | 347,467 | 4.23% |
| Unfunded Actuarial Liability (UAL) | $ 340,068 | $ 299,784 | -11.85% |
| Funded Ratio (AVA) | 49.5% | 53.7% | 4.18% |
| Funded Ratio (MVA) | 52.4% | 58.1% | 5.64% |
| **Contributions** | | | |
| Employer Contribution (FY2018-19) | $ 44,821 | N/A | |
| Employer Contribution (FY2019-20) | $ 45,722 | $ 43,409 | -5.06% |

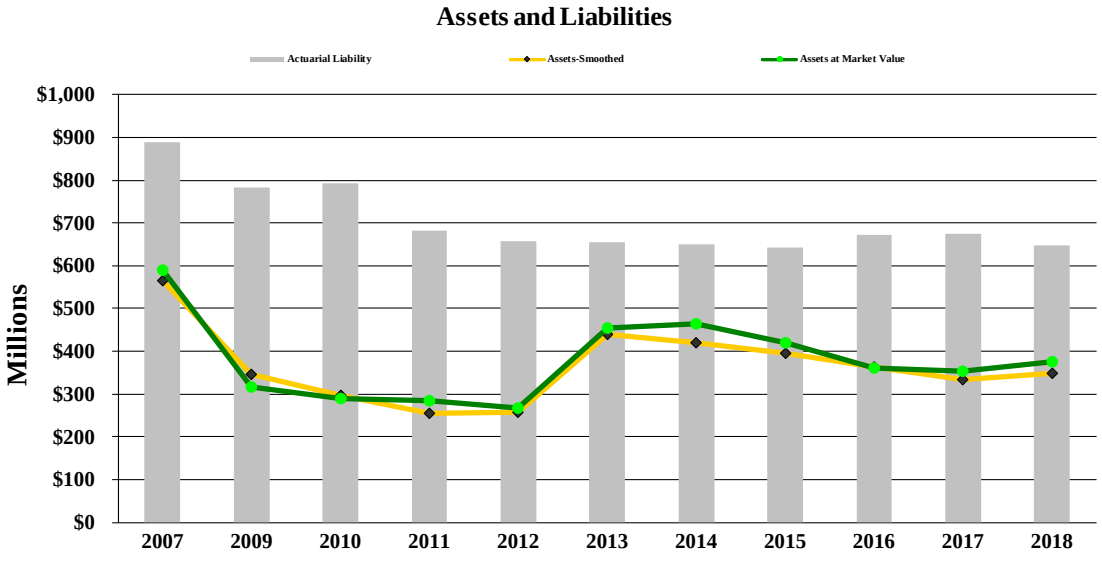
## C. Historical Trends

Despite the fact that for most retirement plans the greatest attention is given to the current valuation results and in particular, the size of the current Unfunded Actuarial Liability and the employer contribution, it is important to remember that each valuation is merely a snapshot in the long-term progress of a pension fund. It is more important to judge a current year's valuation result relative to historical trends, as well as trends expected into the future.

### Assets and Liabilities

The chart below compares the Market Value of Assets (MVA) and Actuarial Value of Assets (AVA) to the Actuarial Liabilities. The percentages shown in the table below the chart are the ratios of the Actuarial Value of Assets to the Actuarial Liability (the funded ratio). We note that for the GASB disclosure report, this ratio is now disclosed using the MVA.

The funded ratio declined from 63.7% in 2007 to 37.5% in 2011 due to negative market returns and no contributions being made in that period ($417 million in proceeds from a POB were deposited in 1997 that acted as prepayments for 15 years of contributions). The funded ratio increased between 2012 and 2013 due to a $210 million contribution in July 2012. The funded ratio decreased from 67.2% to 49.5% between 2013 and 2017 due to assumption changes, liability losses, new Police MOUs, and the lack of contributions since the July 2012 payment. The funded ratio has increased from 49.5% to 53.7% over the past year due to the commencement of contributions, and to a lesser extent, asset and liability gains.

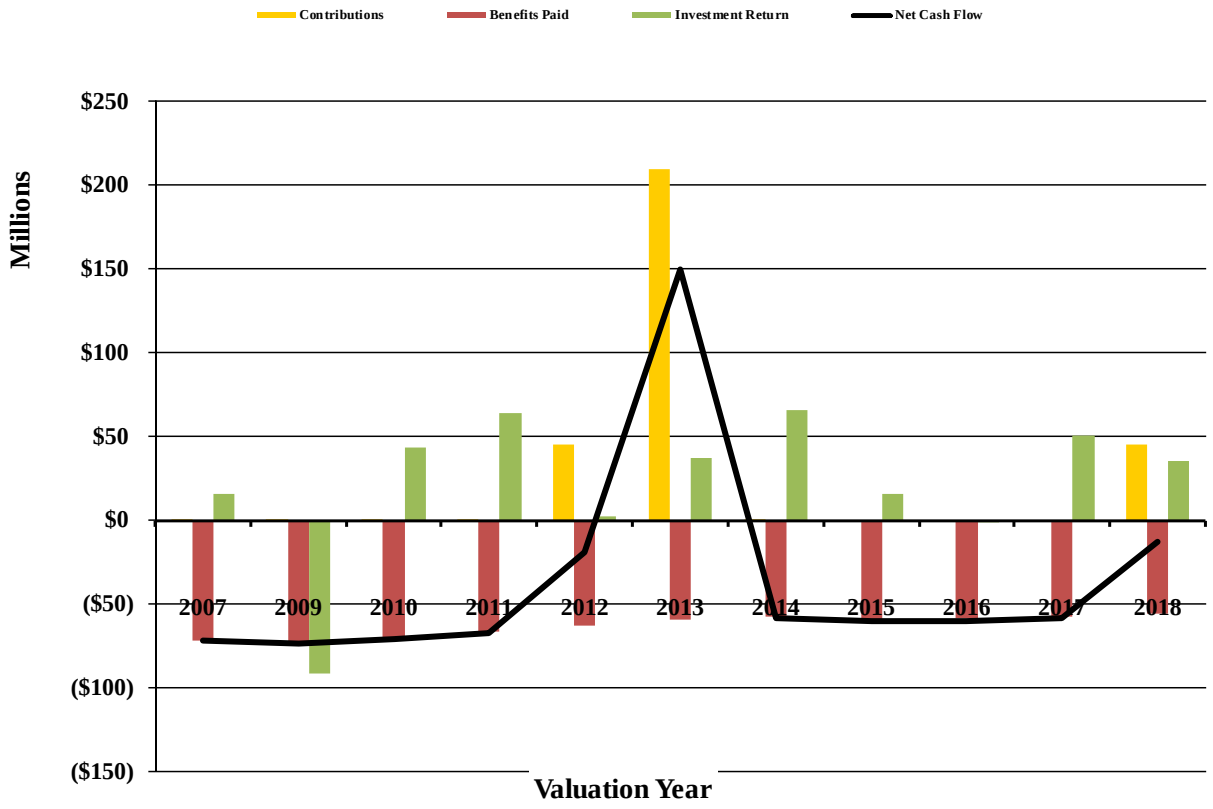



| Valuation Year | 2007 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AVA Funded Ratio | 63.7% | 44.4% | 37.6% | 37.5% | 39.1% | 67.2% | 64.6% | 61.4% | 54.0% | 49.5% | 53.7% |
| UAL (Millions) | $ 322.1 | $ 435.3 | $ 494.4 | $426.8 | $ 401.1 | $215.0 | $230.2 | $ 247.5 | $309.4 | $340.1 | $299.8 |

## SECTION I – EXECUTIVE SUMMARY

### Cash Flows

The chart below shows the Plan's cash flow, excluding investment returns (i.e., contributions less benefit payments and expenses). This is a critical measure, as it reflects the ability to have funds available to meet benefit payments without having to make difficult investment decisions, especially during volatile markets.




The contributions, benefit payments, investment returns, and net cash flow (NCF) excluding investment returns and expenses are represented by the scale on the left. The Plan's net cash flow has been negative six of the last seven fiscal years primarily due to no contributions being made between 2007 and 2011, becoming positive in 2013 when a $210 million contribution was made.

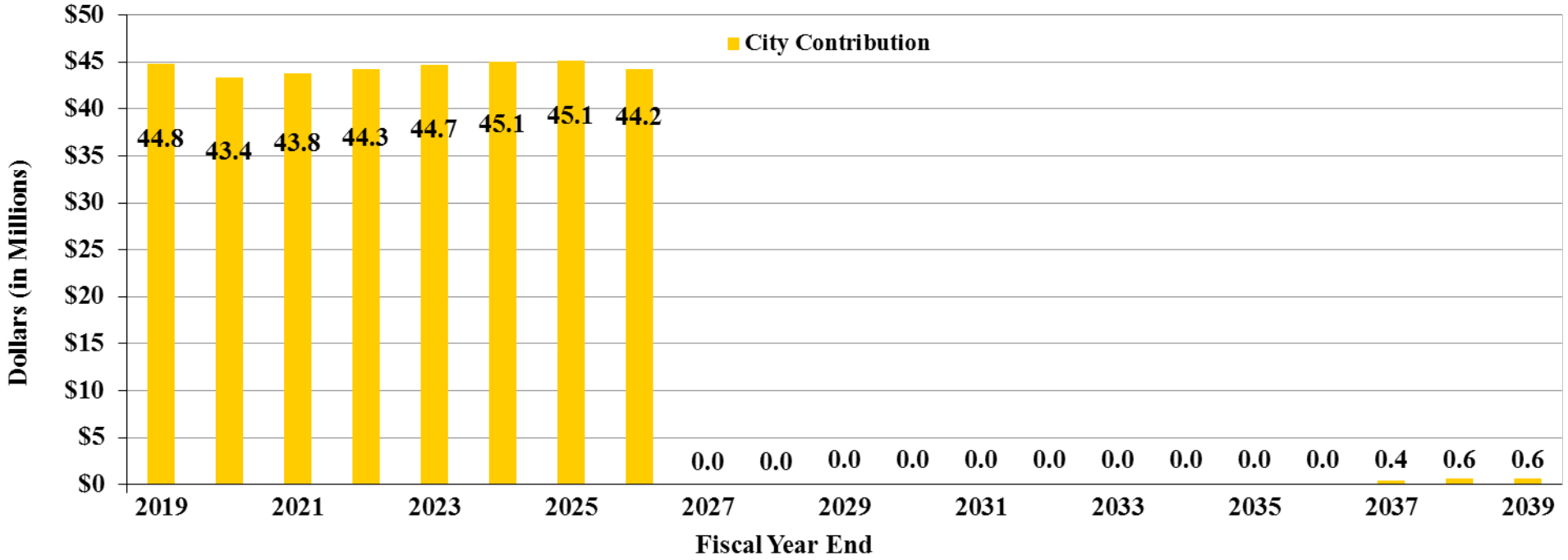
A negative cash flow magnifies the losses during a market decline, hindering the Plan in its ability to absorb market fluctuations. The implications of a plan in negative cash flow are that the impact of market fluctuations can be more severe: as assets are being depleted to pay benefits in down markets, there is less principal available to be reinvested during favorable return periods. The Plan is expected to remain in a negative cash flow position going forward, since the Plan is closed.

## SECTION I – EXECUTIVE SUMMARY

### D. Future Expected Financial Trends

The analysis of projected financial trends is perhaps the most important component of this valuation. In this section, we present our assessment of the implications of the July 1, 2018 valuation results in terms of benefit security (assets over liabilities) and contribution levels. All the projections in this section are based on the assumption that the Plan will exactly achieve the assumed rate of return each year (6.0% per year until 2027, then trending down to an annual return of 3.25% over 10 years).

**Projection of Employer Contributions**




The above graph shows that the City's required contribution declined from $44.8 million in fiscal year 2019 to $43.4 million in fiscal year 2020, and then is expected to increase slightly as the current unfunded liability is fully amortized. This assumes that the annual

## SECTION I – EXECUTIVE SUMMARY

payments by the City will equal the administrative expenses, plus an amount needed to amortize the remaining unfunded liability as a level percentage of overall Safety payroll by July 1, 2026, as is required under the City's charter.

After July 1, 2026, the UAL is expected to be fully amortized, and the contribution would generally be equal to the administrative expense, beginning in 2026-2027. However, under the current asset smoothing method there are still expected to be some deferred asset gains, which will not be recognized until after 2026; the deferred recognition of these gains is expected to offset a small portion of the administrative expenses in the final years of the graph on the previous page.

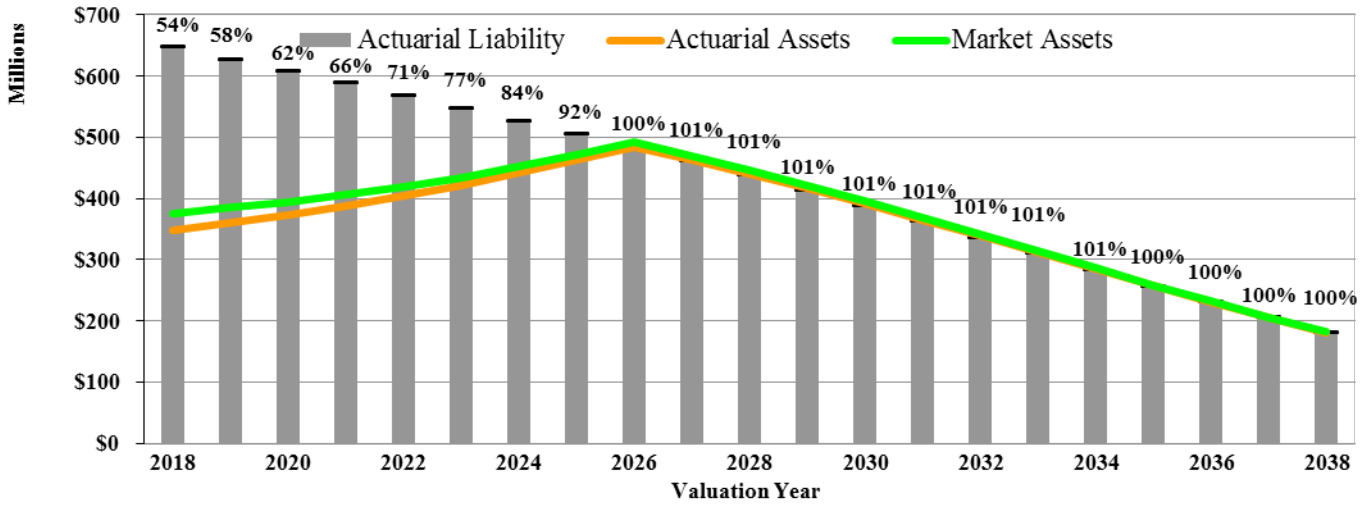
Note that the graph on the previous page does not forecast any future actuarial gains or losses or changes to the amortization policy. Even relatively modest losses could push the employer contribution over $50 million in the next few years. We also note that the occurrence of any future gains or losses in the years leading up to or following the required full amortization date (July 1, 2026) may require a reconsideration of the funding policy for those gains or losses, as otherwise these changes would need to be recognized over an extremely short period.

## SECTION I – EXECUTIVE SUMMARY

### Asset and Liability Projections:

The following graph shows the projection of assets and liabilities assuming that assets will earn the assumed rate of return each year during the projection period.

**Projection of Assets and Liabilities**




The graph shows that the projected funded status increases as the current unfunded liability is fully amortized, assuming all actuarial assumptions are met.

# SECTION II – ASSETS

Pension Plan assets play a key role in the financial operation of the Plan and in the decisions the Board may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact benefit levels, employer contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on Plan assets including:

- **Disclosure** of Plan assets as of June 30, 2017 and June 30, 2018,
- Statement of the **changes** in market values during the year, and
- Development of the **Actuarial Value of Assets**.

## Disclosure

There are two types of asset values disclosed in the valuation, the Market Value of Assets and the Actuarial Value of Assets. The market value represents "snap-shot" or "cash-out" values which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are sometimes not as suitable for long-range planning as are the Actuarial Value of Assets, which reflect smoothing of annual investment returns.

Table II-1 on the next page discloses and compares each component of the market asset value as of June 30, 2017 and June 30, 2018.

## SECTION II – ASSETS

**TABLE II-1**
**Statement of Assets at Market Value**
**June 30,**
**(in thousands)**

| | 2017 | 2018 |
|---|---|---|
| **Cash and Cash Equivalents:** | $ 3,382 | $ 7,821 |
| **Receivables:** | | |
| Interest Receivable | $ 355 | $ 671 |
| Dividends Receivable | 227 | 234 |
| Investments Receivable | 4,008 | 3,001 |
| Retired Members and Beneficiaries | 2,477 | 1,641 |
| Miscellaneous | 187 | 136 |
| Total Receivables | 7,255 | 5,683 |
| **Investments, at Fair Value:** | | |
| Short-term Investments | 5,576 | 4,287 |
| Bonds | 63,600 | 98,313 |
| Domestic Equities and Mutual Funds | 168,467 | 151,601 |
| International Equities and Mutual Funds | 44,590 | 46,770 |
| Alternative Investments | 70,511 | 71,132 |
| Securities Lending Collateral | 31,042 | 43,818 |
| Total Investments | 383,785 | 415,921 |
| Total Assets | 394,422 | 429,425 |
| **Liabilities:** | | |
| Accounts Payable | 23 | 95 |
| Benefits Payable | 4,763 | 4,609 |
| Investments Payable | 5,118 | 4,586 |
| Accrued Investment Management Fees | 281 | 344 |
| Securities Lending Liabilities | 31,034 | 43,815 |
| Total Liabilities | 41,220 | 53,448 |
| **Market Value of Assets** | **$ 353,203** | **$ 375,976** |

## SECTION II – ASSETS

## Changes in Market Value

The components of asset change are:

- Contributions (employer and employee)
- Benefit payments
- Expenses (investment and administrative)
- Investment income (realized and unrealized)

Table II-2 shows the components of a change in the Market Value of Assets during 2017 and 2018.

**TABLE II-2**
**Changes in Market Values**
**June 30,**
**(in thousands)**

| | 2017 | 2018 |
|---|---|---|
| **Contributions** | | |
| Contributions of Plan Members | $ 0 | $ 0 |
| Contributions from the City | 0 | 44,860 |
| Total Contributions | 0 | 44,860 |
| **Investment Income** | | |
| Miscellaneous Income | 70 | 20 |
| Investment Income | 50,159 | 35,435 |
| Total Investment Income | 50,229 | 35,455 |
| **Disbursements** | | |
| Benefit Payments | (57,376) | (55,999) |
| Administrative Expenses | (1,262) | (1,543) |
| Total Disbursments | (58,637) | (57,542) |
| **Net increase (Decrease)** | (8,408) | 22,773 |
| **Net Assets Held in Trust for Benefits:** | | |
| Beginning of Year | 361,611 | 353,203 |
| End of Year | $ 353,203 | $ 375,976 |
| Approximate Return | 15.1% | 10.2% |

## SECTION II – ASSETS

## Actuarial Value of Assets (AVA)

The Actuarial Value of Assets represents a "smoothed" value developed by the actuary to reduce the volatile results, which could develop due to short-term fluctuations in the Market Value of Assets. For this Plan, the Actuarial Value of Assets is calculated on a modified market-related value. The Actuarial Value of Assets recognizes one-fifth of the difference between the expected asset value (based on the 6.00% return assumption from 2017-2018) and the actual market value each year. The actuarial value is restricted to fall between 90% and 110% of the market value.

**Table II-3**
**Development of Actuarial Value of Assets**
**(in thousands)**

| | |
|---|---|
| 1. Calculate Expected Actuarial Value of Assets | |
| a. Value of Actuarial Value of Assets - July 1, 2017 | $ 333,373 |
| b. Total Contributions and Misc Income | 44,880 |
| c. Administrative Expense | (1,543) |
| d. Benefit Payments | (55,999) |
| e. Expected Investment Earnings | 19,628 |
| f. Expected Actuarial Value of Assets - July 1, 2018 [1a + 1b + 1c + 1d + 1e] | $ 340,340 |
| 2. Calculate Final Actuarial Value of Assets | |
| a. Value of Market Value of Assets - July 1, 2018 | $ 375,976 |
| b. Excess of MVA over Expected AVA [2a - 1f] | 35,637 |
| c. Preliminary AVA [1f + 0.2 * 2b] | 347,467 |
| d. 90% of MVA [90% * 2a] | 338,379 |
| e. 110% of MVA [110% * 2a] | 413,574 |
| 3. Final Actuarial Value of Assets [2c, not less than 2d or greater than 2e] | **$ 347,467** |

## SECTION II – ASSETS

## Investment Performance

The following table calculates the investment related gain/loss for the plan year on both a market value and an actuarial value basis. The market value gain/loss is an appropriate measure for comparing the actual asset performance to the previous valuation's 6.00% assumption.

**TABLE II-4**
**Asset Gain/(Loss)**
**(in thousands)**

| | Market Value | Actuarial Value |
|---|---|---|
| **July 1, 2017 value** | **$ 353,203** | **$ 333,373** |
| Contributions of Plan Members | 0 | 0 |
| Contributions from the City | 44,860 | 44,860 |
| Miscellaneous Income | 20 | 20 |
| Benefit Payments | (55,999) | (55,999) |
| Administrative Expenses | (1,543) | (1,543) |
| Expected Investment Earnings (6.00%) | 22,183 | 19,628 |
| Expected Value June 30, 2018 | **$ 362,724** | **$ 340,340** |
| Investment Gain / (Loss) | 13,252 | 7,127 |
| **July 1, 2018 value** | **375,976** | **$ 347,467** |
| | | |
| Return | 10.22% | 8.18% |

## SECTION III – LIABILITIES

In this section, we present detailed information on Plan liabilities including:

- **Disclosure** of Plan liabilities at July 1, 2017 and July 1, 2018
- Statement of **changes** in these liabilities during the year

## Disclosure

Several types of liabilities are typically shown in an actuarial valuation report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them. Note that these liabilities are not applicable for settlement purposes, including the purchase of annuities and the payment of lump sums.

- **Present Value of Future Benefits:** Used for measuring all future Plan obligations, the obligations of the Plan earned as of the valuation date and those to be earned in the future by current plan participants under the current Plan provisions, if all assumptions are met.

- **Actuarial Liability:** Used for funding calculations, this liability is calculated taking the Present Value of Future Benefits and subtracting the Present Value of Future Normal Costs under an acceptable actuarial funding method. Because the Plan has no active members, the Actuarial Liability is equal to the Present Value of Future Benefits (i.e., all benefits are fully accrued).

- **Unfunded Actuarial Liability:** The excess of the Actuarial Liability over the Actuarial Value of Assets.

Table III-1 below discloses each of these liabilities for the current and prior valuations.

**TABLE III-1**
**Liabilities/Net (Surplus)/Unfunded**
**(in thousands)**

| | July 1, 2017 | July 1, 2018 |
|---|---|---|
| **Present Value of Future Benefits** | | |
| Active Participant Benefits | $ 0 | $ 0 |
| Retiree and Inactive Benefits | 673,441 | 647,251 |
| **Present Value of Future Benefits (PVB)** | **$ 673,441** | **$ 647,251** |
| | | |
| **Actuarial Liability** | | |
| Present Value of Future Benefits (PVB) | $ 673,441 | $ 647,251 |
| Present Value of Future Normal Costs (PVFNC) | 0 | 0 |
| **Actuarial Liability (AL = PVB – PVFNC)** | **$ 673,441** | **$ 647,251** |
| Actuarial Value of Assets (AVA) | 333,373 | 347,467 |
| **Net (Surplus)/Unfunded (AL – AVA)** | **$ 340,068** | **$ 299,784** |

## SECTION III – LIABILITIES

## Changes in Liabilities

Each of the liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation (not applicable for this Plan)
- Benefits accrued since the last valuation (not applicable for this Plan)
- Plan amendments
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, dying, or receiving COLA adjustments at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method or software

Unfunded liabilities will change because of all of the above, and also due to changes in Plan assets resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the method used to measure plan assets

**TABLE III-2**
**Changes in Actuarial Liability**
**(in thousands)**

| | | |
|---|---|---|
| Actuarial Liability at July 1, 2017 | $ | 673,441 |
| Actuarial Liability at July 1, 2018 | $ | 647,251 |
| Liability Increase (Decrease) | $ | (26,190) |
| | | |
| Change due to: | | |
| Actuarial Methods / Software Changes | $ | 0 |
| Assumption Change | | (1,475) |
| Accrual of Benefits | | 0 |
| Actual Benefit Payments | | (55,999) |
| Interest | | 38,751 |
| Data Corrections | | 0 |
| Actuarial Liability (Gain)/Loss | $ | (7,467) |

## SECTION III – LIABILITIES

**Table III-3**
**Liabilities by Group as of July 1, 2018**
**(in thousands)**

| | Police | Fire | Total |
|---|---|---|---|
| Actuarial Accrued Liability | | | |
| Active | $ 0 | $ 0 | $ 0 |
| Service Retirees | 246,781 | 83,476 | 330,256 |
| Disabled Retirees | 99,538 | 86,922 | 186,460 |
| Beneficiaries | 68,900 | 61,635 | 130,535 |
| Total Accrued Liability | $ 415,218 | $ 232,033 | $ 647,251 |

## SECTION III – LIABILITIES

**TABLE III-4**
**Development of Actuarial Gain / (Loss)**
**(in thousands)**

| | | |
|---|---|---|
| 1. Unfunded Actuarial Liability at Start of Year (not less than zero) | $ | 340,068 |
| 2. Employer Normal Cost at Start of Year | | 0 |
| 3. Interest on 1. and 2. to End of Year | | 20,404 |
| 4. Contributions and Miscellaneous Income for Prior Year | | 44,880 |
| 5. Administrative Expenses | | (1,543) |
| 6. Interest on 4. and 5. to End of Year | | 1,281 |
| 7. Change in Unfunded Actuarial Liability Due to Changes in Assumptions | | (1,475) |
| 8. Change in Unfunded Actuarial Liability Due to Changes in Actuarial Methods | | 0 |
| 9. Change in Unfunded Actuarial Liability Due to Changes in Plan Design | | 0 |
| 10. Change in Unfunded Actuarial Liability Due to Data Corrections | | 0 |
| 11. Expected Unfunded Actuarial Liability at End of Year [1. + 2. + 3. - 4. - 5. - 6. + 7. + 8. + 9. + 10.] | $ | 314,379 |
| 12. Actual Unfunded Actuarial Liability at End of Year (not less than zero) | | 299,784 |
| 13. Unfunded Actuarial Liability Gain / (Loss) [11. – 12.] | $ | 14,595 |

## SECTION IV – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the Plan. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both stable and predictable.

For this Plan, the actuarial funding method used to determine the normal cost and the Unfunded Actuarial Liability is the **Entry Age Normal** cost method.

The normal cost rate is determined with the normal cost percentage equal to the total Projected Value of Benefits at Entry Age, divided by Present Value of Future Salary at Entry Age. Since there are no longer any active employees, the normal cost for this plan is $0.

The Unfunded Actuarial Liability is the difference between the EAN Actuarial Liability and the Actuarial Value of Assets. For the contribution projections, the UAL payment is based on the unfunded liability of the Plan being fully amortized by June 30, 2026, in accordance with the City Charter. Amortization payments are determined based on an assumption that payments will increase by 3.25% each year, reflecting the assumed ultimate rate of increase in overall City Safety member salaries.

An amount equal to the expected administrative expenses for the Plan is added directly to the actuarial cost calculation.

Table IV-1 on the next page shows the employer contribution amount for the 2019-2020 Fiscal Year. The projected assets and liabilities assume that all actuarial assumptions are met and that contributions are made as expected between now and June 30, 2019.

For this calculation, we have shown the contribution amount using both the projected actuarial and Market Value of Assets. The current funding policy uses the AVA to determine the UAL and the associated amortization payment. We have included the contribution amount as determined using the current Market Value of Assets to demonstrate what the actuarial cost would be if all deferred asset gains were fully recognized at the time the contributions commence. In both cases, the contribution is based on an assumption that the investment returns will exactly equal the assumed rate of return during the 2018-2019 Fiscal Year.

## SECTION IV – CONTRIBUTIONS

**TABLE IV-I**
**Development of Projected 2019-2020 Employer Contribution Amount**
**(in thousands)**

| | Actuarial Value of Assets | Market Value of Assets |
|---|---|---|
| 1. Value of Assets at June 30, 2018: | $ 347,467 | $ 375,976 |
| a. Expected Contributions and Misc Income | $ 44,821 | $ 44,821 |
| b. Expected Administrative Expense | $ (1,007) | $ (1,007) |
| c. Expected Benefit Payments | $ (56,825) | $ (56,825) |
| d. Expected Investment Earnings | $ 20,463 | $ 22,174 |
| 2. Expected Value of Assets at June 30, 2019: | $ 354,920 | $ 385,140 |
| a. Excess of Expected MVA over Expected AVA | $ 30,220 | |
| b. Preliminary AVA [ Expected AVA + 20% * 2a] | $ 360,964 | |
| c. 90% of Expected MVA | $ 346,626 | |
| d. 110% of Expected MVA | $ 423,654 | |
| 3. Final Expected AVA [2b, not less than 2c or greater than 2d] | $ 360,964 | $ 385,140 |
| 4. Entry Age Liability at June 30, 2018 | $ 647,251 | $ 647,251 |
| 5. Expected Benefit Payments | $ (56,825) | $ (56,825) |
| 6. Expected Interest | $ 37,155 | $ 37,155 |
| 7. Expected Entry Age Liability at June 30, 2019 | $ 627,581 | $ 627,581 |
| 8. Projected Unfunded Actuarial Liability: (7) - (3) | 266,617 | 242,442 |
| 9. Funded Ratio: (3) / (7) | 57.5% | 61.4% |
| 10. Unfunded Actuarial Liability Amortization at Middle of Year as a Level Percentage of Payroll (7 Years Remaining) as of June 30, 2019 | 42,373 | 38,531 |
| 11. Expected Administrative Expenses for Fiscal 2018-2019 | 1,036 | 1,036 |
| 12. Total Contribution: (10) + (11) | 43,409 | 39,567 |

# SECTION V – HEADCOUNT AND BENEFIT PAYMENT PROJECTIONS

**Table V-1**
**Benefit Payment and Headcount Projection**

| Fiscal Year Ending June 30, | Police | | Fire | | Total | |
|---|---|---|---|---|---|---|
| | Count | Benefits (in thousands) | Count | Benefits (in thousands) | Count | Benefits (in thousands) |
| 2019 | 492.0 | $ 34,331 | 345.0 | $ 22,493 | 837.0 | 56,825 |
| 2020 | 477.2 | $ 33,594 | 326.3 | $ 21,834 | 803.5 | 55,428 |
| 2021 | 462.3 | $ 33,229 | 308.3 | $ 21,362 | 770.6 | 54,592 |
| 2022 | 447.4 | $ 32,983 | 291.1 | $ 20,747 | 738.5 | 53,731 |
| 2023 | 432.4 | $ 32,850 | 274.6 | $ 20,125 | 707.0 | 52,975 |
| 2024 | 417.3 | $ 32,668 | 258.8 | $ 19,499 | 676.2 | 52,167 |
| 2025 | 402.3 | $ 32,353 | 243.6 | $ 18,868 | 645.9 | 51,221 |
| 2026 | 387.2 | $ 31,979 | 229.1 | $ 18,229 | 616.2 | 50,208 |
| 2027 | 372.0 | $ 31,538 | 215.1 | $ 17,581 | 587.0 | 49,119 |
| 2028 | 356.6 | $ 31,023 | 201.6 | $ 16,919 | 558.1 | 47,942 |
| 2029 | 341.0 | $ 30,425 | 188.5 | $ 16,243 | 529.5 | 46,668 |
| 2030 | 325.1 | $ 29,735 | 176.0 | $ 15,551 | 501.0 | 45,286 |
| 2031 | 308.8 | $ 28,948 | 163.8 | $ 14,839 | 472.6 | 43,787 |
| 2032 | 292.3 | $ 28,056 | 152.0 | $ 14,108 | 444.3 | 42,163 |
| 2033 | 275.3 | $ 27,056 | 140.5 | $ 13,356 | 415.8 | 40,411 |
| 2034 | 258.0 | $ 25,948 | 129.4 | $ 12,584 | 387.4 | 38,532 |
| 2035 | 240.4 | $ 24,737 | 118.6 | $ 11,795 | 359.0 | 36,531 |
| 2036 | 222.7 | $ 23,428 | 108.1 | $ 10,991 | 330.8 | 34,419 |
| 2037 | 204.9 | $ 22,033 | 98.0 | $ 10,178 | 302.8 | 32,211 |
| 2038 | 187.1 | $ 20,566 | 88.2 | $ 9,361 | 275.3 | 29,927 |
| 2039 | 169.5 | $ 19,043 | 78.9 | $ 8,547 | 248.4 | 27,590 |
| 2040 | 152.4 | $ 17,484 | 70.0 | $ 7,744 | 222.4 | 25,228 |
| 2041 | 135.7 | $ 15,911 | 61.7 | $ 6,961 | 197.4 | 22,873 |
| 2042 | 119.9 | $ 14,348 | 53.9 | $ 6,206 | 173.7 | 20,554 |
| 2043 | 104.8 | $ 12,816 | 46.6 | $ 5,486 | 151.4 | 18,302 |
| 2044 | 90.8 | $ 11,336 | 40.0 | $ 4,808 | 130.8 | 16,144 |
| 2045 | 77.9 | $ 9,927 | 34.0 | $ 4,178 | 111.9 | 14,104 |
| 2046 | 66.1 | $ 8,603 | 28.7 | $ 3,599 | 94.8 | 12,202 |
| 2047 | 55.5 | $ 7,379 | 24.0 | $ 3,074 | 79.5 | 10,452 |
| 2048 | 46.1 | $ 6,261 | 19.9 | $ 2,603 | 66.0 | 8,864 |

# SECTION V – HEADCOUNT AND BENEFIT PAYMENT PROJECTIONS

**Table V-1**
**Benefit Payment and Headcount Projection (Continued)**

| Fiscal Year Ending June 30, | Police | | Fire | | Total | |
|---|---|---|---|---|---|---|
| | Count | Benefits (in thousands) | Count | Benefits (in thousands) | Count | Benefits (in thousands) |
| 2049 | 37.9 | $ 5,258 | 16.3 | $ 2,186 | 54.2 | 7,444 |
| 2050 | 30.9 | $ 4,369 | 13.3 | $ 1,821 | 44.1 | 6,190 |
| 2051 | 24.9 | $ 3,594 | 10.7 | $ 1,505 | 35.5 | 5,100 |
| 2052 | 19.8 | $ 2,927 | 8.6 | $ 1,236 | 28.4 | 4,163 |
| 2053 | 15.6 | $ 2,361 | 6.8 | $ 1,008 | 22.4 | 3,369 |
| 2054 | 12.2 | $ 1,886 | 5.4 | $ 817 | 17.6 | 2,703 |
| 2055 | 9.5 | $ 1,494 | 4.2 | $ 659 | 13.7 | 2,152 |
| 2056 | 7.3 | $ 1,173 | 3.3 | $ 528 | 10.5 | 1,701 |
| 2057 | 5.5 | $ 914 | 2.5 | $ 421 | 8.1 | 1,335 |
| 2058 | 4.2 | $ 708 | 1.9 | $ 334 | 6.1 | 1,042 |
| 2059 | 3.1 | $ 545 | 1.5 | $ 264 | 4.6 | 809 |
| 2060 | 2.3 | $ 417 | 1.1 | $ 208 | 3.5 | 624 |
| 2061 | 1.7 | $ 317 | 0.9 | $ 162 | 2.6 | 479 |
| 2062 | 1.3 | $ 239 | 0.6 | $ 126 | 1.9 | 365 |
| 2063 | 0.9 | $ 179 | 0.5 | $ 97 | 1.4 | 275 |
| 2064 | 0.7 | $ 132 | 0.4 | $ 73 | 1.0 | 206 |
| 2065 | 0.5 | $ 97 | 0.3 | $ 55 | 0.7 | 152 |
| 2066 | 0.3 | $ 70 | 0.2 | $ 41 | 0.5 | 111 |
| 2067 | 0.2 | $ 50 | 0.1 | $ 29 | 0.4 | 79 |
| 2068 | 0.2 | $ 34 | 0.1 | $ 21 | 0.3 | 55 |
| 2069 | 0.1 | $ 23 | 0.1 | $ 14 | 0.2 | 37 |
| 2070 | 0.1 | $ 14 | 0.0 | $ 9 | 0.1 | 24 |
| 2071 | 0.0 | $ 9 | 0.0 | $ 6 | 0.1 | 15 |
| 2072 | 0.0 | $ 5 | 0.0 | $ 4 | 0.0 | 8 |
| 2073 | 0.0 | $ 2 | 0.0 | $ 2 | 0.0 | 4 |
| 2074 | 0.0 | $ 1 | 0.0 | $ 1 | 0.0 | 2 |
| 2075 | 0.0 | $ 0 | 0.0 | $ 0 | 0.0 | 1 |
| 2076 | 0.0 | $ 0 | 0.0 | $ 0 | 0.0 | 0 |
| 2077 | 0.0 | $ 0 | 0.0 | $ 0 | 0.0 | 0 |
| 2078 | 0.0 | $ 0 | 0.0 | $ 0 | 0.0 | 0 |

## APPENDIX A – MEMBERSHIP INFORMATION

### Summary of Participant Data as of

| | July 1, 2017 | | | July 1, 2018 | | |
|---|---|---|---|---|---|---|
| **Active Participants** | **Police** | **Fire** | **Total** | **Police** | **Fire** | **Total** |
| Number | 0 | 0 | 0 | 0 | 0 | 0 |
| Number Vested | 0 | 0 | 0 | 0 | 0 | 0 |
| Average Age | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Average Service | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Average Pay | $0 | $0 | $0 | $0 | $0 | $0 |
| **Service Retirees** | | | | | | |
| Number | 260 | 120 | 380 | 250 | 110 | 360 |
| Average Age | 74.3 | 80.2 | 76.1 | 75.0 | 80.8 | 76.8 |
| Average Annual Benefit | $72,011 | $73,308 | $72,420 | $77,420 | $77,216 | $77,358 |
| **Disabled Retirees** | | | | | | |
| Number | 117 | 114 | 231 | 109 | 101 | 210 |
| Average Age | 73.8 | 75.6 | 74.6 | 74.2 | 75.6 | 74.9 |
| Average Annual Benefit | $68,956 | $68,799 | $68,879 | $73,959 | $72,635 | $73,322 |
| **Beneficiaries** | | | | | | |
| Number | 139 | 136 | 275 | 133 | 134 | 267 |
| Average Age | 80.6 | 83.9 | 82.2 | 80.5 | 83.4 | 82.0 |
| Average Annual Benefit | $52,291 | $51,846 | $52,071 | $55,952 | $54,306 | $55,126 |
| **All Inactives** | | | | | | |
| Number | 516 | 370 | 886 | 492 | 345 | 837 |
| Average Age | 75.9 | 80.1 | 77.6 | 76.3 | 80.3 | 77.9 |
| Average Annual Benefit | $66,006 | $64,030 | $65,181 | $70,850 | $66,976 | $69,253 |

Data pertaining to active and inactive Members and their beneficiaries as of the valuation date was supplied by the Plan Administrator on electronic media.

## APPENDIX A – MEMBERSHIP INFORMATION

**Changes in Plan Membership: Police**

| | Actives | Service Retirees | Disabled Retirees | Beneficiaries | Total |
|---|---|---|---|---|---|
| July 1, 2017 | 0 | 260 | 117 | 139 | 516 |
| Retired | 0 | 0 | 0 | 0 | 0 |
| Disabled | 0 | 0 | 0 | 0 | 0 |
| Deceased | 0 | (10) | (8) | (12) | (30) |
| New Beneficiary | 0 | 0 | 0 | 6 | 6 |
| July 1, 2018 | **0** | **250** | **109** | **133** | **492** |

**Changes in Plan Membership: Fire**

| | Actives | Service Retirees | Disabled Retirees | Beneficiaries | Total |
|---|---|---|---|---|---|
| July 1, 2017 | 0 | 120 | 114 | 136 | 370 |
| Retired | 0 | 0 | 0 | 0 | 0 |
| Disabled | 0 | 0 | 0 | 0 | 0 |
| Deceased | 0 | (10) | (13) | (15) | (38) |
| New Beneficiary | 0 | 0 | 0 | 13 | 13 |
| July 1, 2018 | **0** | **110** | **101** | **134** | **345** |

**Changes in Plan Membership: All**

| | Actives | Service Retirees | Disabled Retirees | Beneficiaries | Total |
|---|---|---|---|---|---|
| July 1, 2017 | 0 | 380 | 231 | 275 | 886 |
| Retired | 0 | 0 | 0 | 0 | 0 |
| Disabled | 0 | 0 | 0 | 0 | 0 |
| Deceased | 0 | (20) | (21) | (27) | (68) |
| New Beneficiary | 0 | 0 | 0 | 19 | 19 |
| July 1, 2018 | **0** | **360** | **210** | **267** | **837** |

# APPENDIX A – MEMBERSHIP INFORMATION

**Service Retired Participants**

| Age | Police | | Fire | | Total | |
|---|---|---|---|---|---|---|
| | Number | Total Annual Benefit | Number | Total Annual Benefit | Number | Total Annual Benefit |
| < 50 | 0 | $0 | 0 | $0 | 0 | $0 |
| 50-54 | 0 | $0 | 0 | $0 | 0 | $0 |
| 55-59 | 0 | $0 | 0 | $0 | 0 | $0 |
| 60-64 | 2 | $180,986 | 0 | $0 | 2 | $180,986 |
| 65-69 | 43 | $3,432,355 | 5 | $293,341 | 48 | $3,725,697 |
| 70-74 | 97 | $7,193,936 | 30 | $2,235,561 | 127 | $9,429,496 |
| 75-79 | 72 | $5,391,215 | 24 | $1,872,484 | 96 | $7,263,698 |
| 80-84 | 16 | $1,484,219 | 18 | $1,473,484 | 34 | $2,957,703 |
| 85-89 | 10 | $761,713 | 12 | $864,969 | 22 | $1,626,682 |
| 90-94 | 8 | $744,746 | 15 | $1,286,872 | 23 | $2,031,617 |
| 95-99 | 2 | $165,871 | 6 | $467,041 | 8 | $632,911 |
| 100+ | 0 | $0 | 0 | $0 | 0 | $0 |
| **Total** | 250 | $19,355,040 | 110 | $8,493,751 | 360 | $27,848,791 |

**Disability Retired Participants**

| Age | Police | | Fire | | Total | |
|---|---|---|---|---|---|---|
| | Number | Total Annual Benefit | Number | Total Annual Benefit | Number | Total Annual Benefit |
| < 50 | 0 | $0 | 0 | $0 | 0 | $0 |
| 50-54 | 0 | $0 | 0 | $0 | 0 | $0 |
| 55-59 | 0 | $0 | 0 | $0 | 0 | $0 |
| 60-64 | 0 | $0 | 0 | $0 | 0 | $0 |
| 65-69 | 18 | $1,374,158 | 18 | $1,173,872 | 36 | $2,548,029 |
| 70-74 | 51 | $3,662,356 | 38 | $2,664,960 | 89 | $6,327,317 |
| 75-79 | 25 | $1,817,543 | 26 | $1,921,611 | 51 | $3,739,154 |
| 80-84 | 12 | $907,855 | 9 | $777,041 | 21 | $1,684,896 |
| 85-89 | 2 | $185,176 | 8 | $671,763 | 10 | $856,939 |
| 90-94 | 1 | $114,473 | 2 | $126,839 | 3 | $241,312 |
| 95-99 | 0 | $0 | 0 | $0 | 0 | $0 |
| 100+ | 0 | $0 | 0 | $0 | 0 | $0 |
| **Total** | 109 | $8,061,561 | 101 | $7,336,085 | 210 | $15,397,647 |

# APPENDIX A – MEMBERSHIP INFORMATION

**Beneficiaries**

| | Police | | Fire | | Total | |
|---|---|---|---|---|---|---|
| Age | Number | Total Annual Benefit | Number | Total Annual Benefit | Number | Total Annual Benefit |
| < 50 | 0 | $0 | 0 | $0 | 0 | $0 |
| 50-54 | 0 | $0 | 0 | $0 | 0 | $0 |
| 55-59 | 2 | $116,871 | 1 | $81,377 | 3 | $198,248 |
| 60-64 | 4 | $239,806 | 4 | $202,166 | 8 | $441,973 |
| 65-69 | 13 | $702,921 | 12 | $706,884 | 25 | $1,409,805 |
| 70-74 | 28 | $1,446,498 | 13 | $711,007 | 41 | $2,157,505 |
| 75-79 | 20 | $1,018,632 | 16 | $827,609 | 36 | $1,846,241 |
| 80-84 | 14 | $870,859 | 22 | $1,191,379 | 36 | $2,062,238 |
| 85-89 | 19 | $1,148,869 | 26 | $1,217,755 | 45 | $2,366,624 |
| 90-94 | 25 | $1,425,349 | 29 | $1,662,162 | 54 | $3,087,511 |
| 95-99 | 7 | $395,347 | 7 | $355,737 | 14 | $751,084 |
| 100+ | 1 | $76,482 | 4 | $320,966 | 5 | $397,448 |
| **Total** | 133 | $7,441,635 | 134 | $7,277,041 | 267 | $14,718,675 |

# APPENDIX B – STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods used in the actuarial valuation as of July 1, 2018 are:

## Actuarial Method

The Entry Age Normal Actuarial Cost Method is used. Under this method, the Plan's Actuarial Liability (AL) is determined as the Present Value of Future Benefits (PVFB) less the Present Value of Future Normal Costs (PVFNC). Since all of the Plan's members are retired, the AL and the PVFB are the same.

The excess of the AL over the Actuarial Value of Assets (AVA) is the Unfunded Actuarial Liability (UAL). In accordance with the Plan's funding agreement with the City of Oakland, the UAL must be amortized by July 1, 2026, with contributions resuming in the 2017-2018 fiscal year. The projected fiscal year 2019-2020 contribution has been calculated using level percent of pay amortization, based on total projected City payroll for all Safety employees.

## Actuarial Value of Plan Assets

In determining the recommended employer contribution to the PFRS, we use a smoothed Actuarial Value of Assets. The asset smoothing method dampens the volatility in asset values that could occur because of the fluctuations in market conditions. Use of an asset smoothing method is consistent with the long-term nature of the actuarial valuation process. Assets are assumed to be used exclusively for the provision of retirement benefits and expenses.

The Actuarial Value of Assets is equal to 100% of the *expected Actuarial Value of Assets* plus 20% of the difference between the current Market Value of Assets and the expected Actuarial Value of Assets. In no event will the Actuarial Value of Assets ever be less than 90% of the Market Value of Assets or greater than 110% of the Market Value of Assets.

The expected Actuarial Value of Assets is equal to the prior year's Actuarial Value of Assets increased with actual contributions made, decreased with actual disbursements made, all items (prior assets, contributions, and disbursements) further adjusted with expected investment returns for the year.

# APPENDIX B – STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

## Actuarial Assumptions

The assumptions used in this report reflect the results of an experience study performed by Cheiron covering the period from July 1, 2014 through June 30, 2017 and adopted by the Board. More details on the rationale for the demographic and economic assumptions can be found in the experience analysis presented to the Board on February 28, 2018.

### 1. Rate of Return

The expected annual rates of return, net of investment expenses, on all Plan assets are shown in the table below. The equivalent single discount rate for these returns using the Plan's expected projected benefit payments is 5.50%.

| Benefit Payment Year | Expected Return |
|---|---|
| 2018-2026 | 6.000% |
| 2027 | 5.725% |
| 2028 | 5.450% |
| 2029 | 5.175% |
| 2030 | 4.900% |
| 2031 | 4.625% |
| 2032 | 4.350% |
| 2033 | 4.075% |
| 2034 | 3.800% |
| 2035 | 3.525% |
| 2036+ | 3.250% |

### 2. Inflation

The assumed rate of general inflation is 2.75% (entire US) and local inflation is 2.85% (Bay Area). The general inflation rate is used in the determination of the investment return assumptions. The local inflation rate is used in the determination of the growth in expenses and salaries (which determine the COLA increases).

### 3. Administrative Expenses

Annual administrative expenses are assumed to be $1,007,070, growing at 2.85% per year.

### 4. Cost-of-Living Adjustments and Long-Term Salary Increases

Cost-of-living adjustments are based on salary increases for a retiree's rank at retirement.

## APPENDIX B – STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

The long-term rate of salary increase is assumed to be 3.25% (2.85% inflation plus 0.4% productivity). The following schedule shows salary increases based on the current Police contract that expires on June 30, 2023, and the Fire contract which expires on October 31, 2020. All increases shown after those dates are assumptions (we have an assumed a 3.25% increase for Fire will occur in FY2020-21).

| Post-Retirement Benefit Increases (Based on Salary Increases for Rank at Retirement) | | |
|---|---|---|
| Date of Increase | Police | Fire |
| November 1, 2018 | 0.00% | 1.00% |
| January 1, 2019 | 2.50% | 1.00% |
| November 1, 2019 | 0.00% | 2.00% |
| July 1, 2020 | 2.50% | 3.25% |
| July 1, 2021 | 3.00% | 3.25% |
| July 1, 2022 | 3.50% | 3.25% |
| July 1, 2023 | 3.50% | 3.25% |
| Annual Increases Starting July 1, 2024 | 3.25% | 3.25% |

### 5. Longevity Pay for Fire Retirees

Longevity Pay payments for Fire retirees are assumed to be the dollar amount below multiplied by the retiree's benefit percentage at retirement. Surviving spouses are assumed to receive the same payment, multiplied by their assumed continuance percentage.

| Benefit Payment Year | Fire Longevity Pay |
|---|---|
| 2019 | $ 1,250 |
| 2020 | $ 1,300 |
| 2021+ | $ 1,350 |

### 6. Rates of Termination

None

### 7. Rates of Disability

None

## APPENDIX B – STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

### 8. Rates of Retirement

None

### 9. Rates of Mortality for Healthy Lives

CalPERS Healthy Annuitant Table from the 2012-2015 experience study, excluding the 15-year projection using 90% of Scale MP-2016.

### 10. Rates of Mortality for Disabled Retirees

CalPERS Industrial Disability Mortality Table from the 2012-2015 experience study, excluding the 15-year projection using 90% of Scale MP-2016.

### 11. Mortality Improvement

The mortality tables are projected to improve with MP-2017 generational mortality improvement tables, with improvements projected from a base year of 2014 (the mid-point of the CalPERS base tables).

### 12. Survivor Continuance

30% of disabled retirees' deaths are assumed to be related to injuries arising out of the performance of duty, entitling the surviving spouse to a 100% continuance.

### 13. Changes in Assumptions Since the Last Valuation

New Memorandums of Understanding (MOUs) went into effect for Police and Fire members after the previous valuation, changing Police and Fire retirees' Cost-of-Living Adjustments (COLAs) and adding benefits tied to Longevity Pay for Fire retirees. No other changes have been made to the actuarial assumptions.

# APPENDIX C – SUMMARY OF PLAN PROVISIONS

## 1. Plan Year

July 1 to June 30.

## 2. Membership

The Plan has been closed to new members since June 30, 1976.

## 3. Salary

Retirement allowances are based on the pensionable compensation attached to the average rank held during the three years immediately preceding retirement.

## 4. Employee Contributions

There are no active employees in the Plan, and thus no employee contributions.

## 5. Service Retirement

Eligibility
25 years of service, or 20 years of service and age 55, or age 65. A reduced early retirement is available with 20 years of service.

Benefit Amount
50% of Salary plus 1.67% for each additional year of service beyond that required for service retirement eligibility, to a maximum of 10 years. For retirements with less than 20 years of service, benefits are pro-rated.

## 6. Duty-Related Disability Retirement

Equivalent to service retirement benefit if 25 or more years of service.

## 7. Non-Duty Related Disability Retirement

Equivalent to service retirement benefit if age 55 is attained.

## 8. Post-Retirement Death Benefit

For retirees without a spouse at death, a $1,000 lump sum is paid to designated beneficiary.

## 9. Cost-of-Living Adjustments

Benefit increases are based on increases in salary for rank at retirement (see above definition of Salary).

# APPENDIX C – SUMMARY OF PLAN PROVISIONS

## 10. Benefit Forms

Benefit is paid for the lifetime of the member. For non-duty related deaths after retirement, a 66-2/3% continuance is paid for the lifetime of the spouse. If the death is duty-related, a continuance of 100% is paid.

## 11. Changes in Plan Provisions Since the Last Valuation

None

# APPENDIX D – GLOSSARY

## 1. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs such as mortality, withdrawal, disability, retirement, changes in compensation, and rates of investment return.

## 2. Actuarial Cost Method

A procedure for determining the actuarial present value of pension plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a normal cost and an Actuarial Liability.

## 3. Actuarial Gain (Loss)

The difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

## 4. Actuarial Liability

The portion of the Actuarial Present Value of Projected Benefits that will not be paid by future normal costs. It represents the value of the past normal costs with interest to the valuation date.

## 5. Actuarial Present Value (Present Value)

The value as of a given date of a future amount or series of payments. The actuarial present value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made.

## 6. Actuarial Valuation

The determination, as of a specified date, of the normal cost, Actuarial Liability, Actuarial Value of Assets, and related actuarial present values for a pension plan.

## 7. Actuarial Value of Assets

The value of cash, investments, and other property belonging to a pension plan as used by the actuary for the purpose of an actuarial valuation. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values.

## 8. Actuarially Equivalent

Of equal actuarial present value, determined as of a given date, with each value based on the same set of actuarial assumptions.

## APPENDIX D – GLOSSARY

**9. Amortization Payment**

The portion of the pension plan contribution that is designed to pay interest and principal on the Unfunded Actuarial Liability in order to pay for that liability in a given number of years.

**10. Entry Age Normal Actuarial Cost Method**

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages.

**11. Funded Ratio**

The ratio of the Actuarial Value of Assets to the Actuarial Liabilities.

**12. Normal Cost**

That portion of the actuarial present value of pension plan benefits and expenses which is allocated to a valuation year by the actuarial cost method.

**13. Projected Benefits**

Those pension plan benefit amounts which are expected to be paid in the future under a particular set of actuarial assumptions, taking into account such items as increases in future compensation and service credits.

**14. Unfunded Actuarial Liability**

The excess of the Actuarial Liability over the Actuarial Value of Assets.

CHEIRON

*Classic Values, Innovative Advice*