# RETIREMENT PLAN FOR EMPLOYEES OF THE CITY OF CREVE COEUR

## Actuarial Valuation Report
## July 1, 2019

**Prepared by**

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# Introduction and Purpose

In this report, we present the results of the July 1, 2019 actuarial valuation for the Retirement Plan for Employees of the City of Creve Coeur.

## Purposes of the Valuation

The actuarial valuation of the Plan is intended to accomplish several purposes:

(a) In general, the determination of current levels of employer contributions which, together with prior funding, will accumulate monies sufficient to meet benefit payments when due under the terms of the Plan;

(b) review plan experience for the year ended on the valuation date to ascertain whether the assumptions and methods employed for valuation purposes are reflective of actual events and remain appropriate for prospective application; and

(c) assessment of the relative funded position of the plan on an ongoing basis, i.e., through a comparison of plan assets and projected plan liabilities.

# Actuarial Certification

As requested, we have performed an actuarial valuation of the Retirement Plan for Employees of the City of Creve Coeur as of July 1, 2019 for the Plan Year ending June 30, 2020. Our findings are set forth in this actuary's report. This report reflects the benefit provisions in effect on July 1, 2019.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the the Plan's Administrative Staff. This information includes, but is not limited to, statutory plan provisions, employee data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the Plan have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the Plan and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the Plan. Further, in our opinion, each actuarial assumption used is reasonably related to the experience of the Plan and to reasonable expectations which, in combination, represent our best estimate of anticipated experience under the Plan.

This valuation report is only an estimate of the Plan's financial condition as of a single date. It can neither predict the Plan's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of Plan benefits, only the timing of Plan contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The City has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in this report.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the Fund. The calculations in the enclosed report have been made on a basis consistent with our understanding of the Fund's funding requirements and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

# Actuarial Certification

Milliman's work is prepared solely for the internal business use of the City of Creve Coeur and its employees (for their use in administering the Plan). To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

(a) The System may provide a copy of Milliman's work, in its entirety, to the System's professional advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the System.

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No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their specific needs.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the City. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and has been prepared in accordance with generally recognized accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

We respectfully submit the following report, and we look forward to discussing it with you.

| | |
|---|---|
| Michael J. Zwiener, FSA | William Winningham, EA, MAAA |
| Consulting Actuary | Consulting Actuary |

# Discussion of Valuation Results

## Actuarially Determined Contribution

The results of this valuation are used to actuarially determine contribution amounts to the Fund for the July 1, 2019 - June 30, 2020 fiscal year. A comparison of actuarially determined contribution amounts for the current and immediately preceding valuation are summarized below:

| | Actuarial Valuation as of | |
|---|---|---|
| | **July 1, 2018** | **July 1, 2019** |
| Actuarially Determined Employer Contribution* | $1,262,474 | $1,252,981 |
| Actuarially Determined Employer Contribution** | $1,347,691 | $1,337,557 |
| Actual Employer Contribution | $1,307,755 | N/A |

* Assuming payment as of first day of plan year
**Assuming payment as of last day of plan year

## Plan Assets

The market value of plan assets increased from $25,729,821 at July 1, 2018 to $26,718,920 at June 30, 2019. A balance sheet and statement of income and disbursements are presented on pages 7 and 8. Investment income (net of expense) was $1,412,380 for a return of 5.5%. During the prior year, investment return was 7.7%. Contributions to the fund were $1,394,369 and benefit payments were $1,817,650.

Valuation assets are defined to be actuarial value using an asset smoothing method. On an actuarial value basis, fund assets are $26,870,606 on July 1, 2019, compared to $25,291,347 on July 1, 2018. Net investment income was $2,002,540 for return of 8%. The development of the actuarial value of assets is shown on page 9.

## Actuarial Assumptions, Methods and Plan Provisions

An explicit provision was included in calculating the Actuarially Determined Contribution by adding assumed administrative expenses for the current year. The assumed administrative expenses are a two year average of administrative expenses from the previous two years.

All other actuarial assumptions, methods, and Plan provisions remained the same as the prior valuation. Descriptions of all actuarial assumptions, methods, and Plan provisions can be found on pages 13-16.

## Plan Population

The number of active participants decreased from 40 on July 1, 2018 to 36 on July 1, 2019. The number of retirees/beneficiaries/disableds increased from 78 to 81, and the number of deferred vested participants remained at 29.

# Discussion of Valuation Results

## Plan Experience

Plan experience resulted in an overall experience gain for the plan year ending June 30, 2019. The gain is primarily due to the actuarial assets earning in excess of the assumed 6.75% as well as a net gain on liability.

## GASB 67/68

Results under GASB 67 and 68 are presented in a separate report.

## Funded Status - Accrued Benefit Basis

Another measure of a plan's funded status is the relationship of the market value of plan assets to the present value of benefits accrued to date. The amounts for the current and prior year are shown in the following table:

| | Valuation Date<br>**July 1, 2018** | Valuation Date<br>**July 1, 2019** |
|---|---|---|
| a) Present Value of Vested Accrued Benefits | $29,678,099 | $30,215,324 |
| b) Present Value of All Accrued Benefits | $30,192,891 | $30,676,622 |
| c) Market Value of Assets | $25,729,821 | $26,718,920 |
| d) Ratio: (c)/(a) | 86.7% | 88.4% |
| e) Ratio: (c)/(b) | 85.2% | 87.1% |

The interest discount utilized for this purpose was 6.75% in 2018 and 2019. The discount rate that is required to value plan liabilities on a settlement basis is typically lower than the "ongoing basis" discount rate. Therefore, these amounts should not be used to assess the plan's funded status on a settlement basis.

## Funded Status - Actuarial Accrued Liability Basis

The most common measure of a public sector plan's funded status is dividing the Plan Assets by the Actuarial Accrued Liability. As of the valuation date, this ratio is 82.7% using Actuarial Value of Assets and 82.3% using the Market Value of Assets.

# Summary of Valuation Results

| | Valuation Date<br>**July 1, 2018** | Valuation Date<br>**July 1, 2019** |
|---|---|---|
| **Participant Data** | | |
| Number of Participants | | |
| Active participants | 40 | 36 |
| Terminated vested participants | 29 | 29 |
| Retirees and beneficiaries | 78 | 81 |
| Total | 147 | 146 |
| Covered Payroll | 3,224,888 | 2,611,428 |
| **Assets** | | |
| Market Value of Assets | 25,729,821 | 26,718,920 |
| Investment Yield | 7.7% | 5.5% |
| Actuarial Value of Assets | 25,291,347 | 26,870,606 |
| Investment Yield | 6.9% | 8.0% |
| **Actuarial Present Values** | | |
| Accrued Liability | 32,083,624 | 32,474,104 |
| - Actuarial Value of Assets | 25,291,347 | 26,870,606 |
| Unfunded Accrued Liability | 6,792,277 | 5,603,498 |
| Funded Ratio (Market Value Basis) | 80.2% | 82.3% |
| Funded Ratio (Actuarial Value Basis) | 78.8% | 82.7% |
| **Costs and Contributions** | | |
| Normal Cost | 291,592 | 272,815 |
| % of Covered Payroll | 9.0% | 10.4% |
| Actuarially Determined Contribution (ADC) | 1,262,474 | 1,252,981 |
| % of Covered Payroll* | 39.2% | 48.0% |
| **Funded Status of Accumulated Benefits** | | |
| Present Value of Accrued Benefits | 30,192,891 | 30,676,622 |
| Funded Ratio (Market Value Basis) | 85.2% | 87.1% |
| Funded Ratio (Actuarial Value Basis) | 83.8% | 87.6% |

*Since the Plan has been closed to new members since 2006, Active Participant headcount as well as Covered Payroll have steadily declined (in line with expectations). Coupled with the aggressive funding policy (10-year amortization of the pre-2015 UAL), the ADC when expressed as a % of payroll is sharply increased. In dollar terms, the ADC has remained relatively flat and is expected to remain so through 2024. At that time, the pre-2015 UAL will be fully amortized and the ADC will decrease significantly.

# Statement of Assets as of June 30, 2019

| Assets | Market Value |
|---|---|
| Commerce | $7,343,612 |
| Schwab | 19,375,308 |
| Total Assets | 26,718,920 |
| **Liabilities** | |
| None | |
| **Net Assets** | $26,718,920 |

# Statement of Income and Disbursements

| | |
|---|---|
| **Market Value of Assets as of July 1, 2018** | $25,729,821 |
| **Income** | |
| Employer Contributions | 1,307,755 |
| Employee Contributions | 86,614 |
| Interest and Dividends | 696,876 |
| Net Appreciation/(Depreciation) | 787,770 |
| Investment Expenses | (20,000) |
| Total Income | 2,859,015 |
| **Disbursements** | |
| Employee Benefit Distributions | 1,817,650 |
| Administrative Expenses | 52,266 |
| Total Expenses | 1,869,916 |
| Net Increase (Decrease) | 989,099 |
| **Market Value of Assets as of June 30, 2019** | $26,718,920 |
| **Net Rate of Return** | 5.5% |

# Development of Actuarial Value of Assets

| | |
|---|---:|
| **1. Actuarial Value Beginning of Year** | $25,291,347 |
| **2. Market Value End of Year** | 26,718,920 |
| **3. Market Value Beginning of Year** | 25,729,821 |
| **4. Non-Investment Cash Flows** [(1)] | (423,281) |
| **5. Investment Income** | |
| a. Market Total: (2) - (3) - (4) | 1,412,380 |
| b. Assumed Rate of Return | 6.75% |
| c. Expected Investement Return [(2)] | 1,722,477 |
| d. Gain/(Loss): (5a) - (5c) | (310,097) |
| **6. Phased-In Recognition of Investment Income** | |
| a. Current Year: (1/3) x (5d) | (103,366) |
| b. (1/3) of Gain/(Loss) during plan year ending June 30, 2018 | 55,049 |
| c. (1/3) of Gain/(Loss) during plan year ending June 30, 2017 | 328,380 |
| d. Phased-In Investment Gain to be Recognized in Current Year: (6a) + (6b) + (6c) | 280,063 |
| **7. Actuarial Value End of Year: (1) + (4) + (5c) + (6d)** | $26,870,606 |
| **8. Excess of Market Value over Actuarial Value: (2) - (7)** | (151,686) |
| **9. Approximate Rate of Return on Actuarial Value** | 8.0% |
| **10. Ratio of Actuarial Value of Assets to Market Value of Assets: (7) / (2)** | 100.6% |

[(1)] Contributions less benefit payments
[(2)] Assumed Rate times (3) + (4) times Assumed Rate/2

# Statement of Accrued Benefits

| | July 1, 2018 | July 1, 2019 |
|---|---|---|
| **1. Accumulated Plan Benefits** | | |
| a. Actuarial Present Value of Vested Benefits | | |
| i. Participants currently receiving payments | 18,545,877 | 19,268,530 |
| ii. Active Participants | 8,892,656 | 8,566,961 |
| iii. Deferred Vested Participants | 2,239,566 | 2,379,833 |
| iv. Total Vested Benefis | 29,678,099 | 30,215,324 |
| b. Actuarial Present Value of Non-Vested Benefits | 514,792 | 461,298 |
| c. Total Actuarial Present Value of Accumulated Plan Benefits: (aiv) + (b) | 30,192,891 | 30,676,622 |
| **2. Net Assets (Market Value) available for benefits** | 25,729,821 | 26,718,920 |
| **3. Funded Ratio** | | |
| a. Vested Benefits: (2) / (1aiv) | 86.7% | 88.4% |
| b. Accumulated Benefits: (2) / (1c) | 85.2% | 87.1% |
| **4. Net Assets (Actuarial Value) available for benefits** | 25,291,347 | 26,870,606 |
| **5. Funded Ratio** | | |
| a. Vested Benefits: (4) / (1aiv) | 85.2% | 88.9% |
| b. Accumulated Benefits: (4) / (1c) | 83.8% | 87.6% |

# Development of Actuarially Determined Contribution

| | July 1, 2019 |
|---|---|
| **1. Accrued Liability** | |
| a. Active Participants | $10,825,741 |
| b. Terminated Vested Participants | 2,379,833 |
| c. Retired Participants | 19,268,530 |
| d. Total | 32,474,104 |
| **2. Actuarial Value of Assets** | 26,870,606 |
| **3. Funded Ratio: (2) / (1d)** | 82.7% |
| **4. Covered Payroll** | 2,611,428 |
| **5. Unfunded Actuarial Liability (UAL)** | 5,603,498 |
| a. Outstanding UAL from July 1, 2015 | 4,724,214 |
| b. Outstanding UAL after July 1, 2015 | 879,284 |
| **6. Normal Cost:** | |
| a. Entry Age Normal Cost | 272,815 |
| b. Expected Employee Contributions | 78,343 |
| i. As a percentage of Covered Payroll: (6b) / (3) | 3.0% |
| c. Employer Normal Cost without Expenses: (6a) - (6b) | 194,472 |
| ii. As a percentage of Covered Payroll: (6c) / (3) | 7.4% |
| d. Assumed Administrative Expenses | 48,200 |
| e. Employer Normal Cost including Expenses: (6c) + (6d) | 242,672 |
| **7. 10-Year Amortization of UAL from July 1, 2015** | 921,296 |
| **8. 15-Year Amortization of Additional UAL after July 1, 2015** | 89,013 |
| **9. Employer Cost** | |
| a. Actuarially Determined Contribution: (6e) + (7) + (8) | 1,252,981 |
| b. Payable as of the end of the plan year: (9a) x 1.0675 | 1,337,557 |
| c. As a percentage of Covered Payroll: (9a) / (4) | 48.0% |

# Historical Investment Returns on Market Value Basis

| Year Ended | | | Rate of Return | | |
|---|---|---|---|---|---|
| June 30 | Annual | Cumulative | Last 5 Years | Last 10 Years | Last 20 Years |
| 1995 | 8.09% | 8.09% | N/A | N/A | N/A |
| 1996 | 14.35% | 11.18% | N/A | N/A | N/A |
| 1997 | 18.08% | 13.43% | N/A | N/A | N/A |
| 1998 | 17.31% | 14.39% | N/A | N/A | N/A |
| 1999 | 8.46% | 13.18% | 13.18% | N/A | N/A |
| 2000 | 9.27% | 12.52% | 13.42% | N/A | N/A |
| 2001 | -5.76% | 9.70% | 9.12% | N/A | N/A |
| 2002 | -10.64% | 6.93% | 3.20% | N/A | N/A |
| 2003 | 1.59% | 6.32% | 0.28% | N/A | N/A |
| 2004 | 13.39% | 7.01% | 1.17% | 7.01% | N/A |
| 2005 | 6.21% | 6.93% | 0.60% | 6.82% | N/A |
| 2006 | 8.62% | 7.07% | 3.50% | 6.27% | N/A |
| 2007 | 16.67% | 7.78% | 9.17% | 6.14% | N/A |
| 2008 | -8.15% | 6.56% | 6.99% | 3.58% | N/A |
| 2009 | -18.25% | 4.69% | 0.21% | 0.69% | N/A |
| 2010 | 12.16% | 5.14% | 1.31% | 0.95% | N/A |
| 2011 | 19.62% | 5.94% | 3.28% | 3.39% | N/A |
| 2012 | 0.23% | 5.62% | 0.19% | 4.58% | N/A |
| 2013 | 12.87% | 5.99% | 4.41% | 5.69% | N/A |
| 2014 | 17.86% | 6.55% | 12.34% | 6.10% | 6.55% |
| 2015 | 1.99% | 6.33% | 10.22% | 5.67% | 6.24% |
| 2016 | 1.15% | 6.09% | 6.58% | 4.92% | 5.59% |
| 2017 | 11.43% | 6.32% | 8.87% | 4.44% | 5.29% |
| 2018 | 7.69% | 6.37% | 7.85% | 6.12% | 4.84% |
| 2019 | 5.50% | 6.34% | 5.48% | 8.86% | 4.69% |

# Actuarial Methods

Following are brief descriptions of the actuarial cost and asset valuation methods used in the valuation.

**Actuarial Cost Method**

Entry Age Normal

The Entry Age Normal Cost Method on an individual basis is used. Normal costs are computed as a level percentage of pay.

The Unfunded Entry Age Accrued Liability as of July 1, 2015 is amortized over a 10 year period. Each year, the amortization period will decrease by 1 until it reaches 0 years as of July 1, 2025. Any subsequent Unfunded Entry Age Accrued Liability is amortized over an open 15 year period.

**Asset Valuation Method**

A three-year smoothed value, with difference between actual investment return and expected investment return recognized in equal installments over a three-year period.

# Actuarial Assumptions

Following are the primary actuarial assumptions used in performing the valuation.

**Interest Rates**
6.75% per annum (effective July 1, 2018), net of investment expenses

**Annual Pay Increases**
4.00% per year

**Mortality**
RP-2000 Combined Healthy Table with a 70% Blue Collar adjustment with a fully generational projection of mortality improvement using Scale BB

**Turnover**
Rates are as follows:

| Age | Percentage |
|---|---|
| 25 | 10% |
| 35 | 8% |
| 45 | 4% |
| 55 | 0% |

**Rate of Disability**
None assumed.

**Retirement**
Non-Uniformed: Participants are assumed 60% retirement at their Unreduced Early Retirement Age, if it is prior to their Normal Retirement Age. Retirement rates of 5% are assumed between their Unreduced Early Retirement Age and age 65, at which a retirement rate of 100% is assumed.

Uniformed: Retirement rates are as follows:

| Age | Percentage |
|---|---|
| 55 | 60% |
| 56 - 61 | 5% |
| 62 | 100% |

**Administrative Expenses**
Average of last two years of administrative expenses (effective July 1, 2019)

**Marriage**
For retired members, actual marital status and spouse birth date is used. For active members, 100% are assumed married with males assumed three years older than their spouses.

**Form of Payment**
It is assumed that all employees will elect a life annuity with 120 months guaranteed.

# Summary of Plan Provisions

A summary of the current primary provisions of the Plan are described below. A complete description of the provisions can be found in the local statutes.

| | |
|---|---|
| **Effective Date** | Last amended and restated effective July 1, 2013. |
| **Eligibility** | Full-time employees enter the Plan on the July 1 on or immediately following their completion of two years of continuous employment and attainment of age 21. No Employees hired after May 23, 2006 may enter the Plan. |
| **Employee Contributions** | Participants are required to contribute 3% of salary. Contributions accumulate at an interest rate of 5%. |
| **Credited Service** | Elapsed time, in years and completed months, from date of hire. |
| **Final Average Compensation** | Average of the high 60 consecutive months in the last 120 months. |
| **Normal Retirement Age** | Age 55 for a uniformed participant and age 65 for a non-uniformed participant. |
| **Normal Retirement Benefit** | A benefit equal to Final Average Compensation times 1.7% times Credited Service not to exceed 30 years. If a participant elected not to participate in the City's defined contribution plan, then the multiplier would be 2.0%. |
| **Normal Form of Payment** | The benefit is payable for 120 months guaranteed and for the member's lifetime, thereafter. |
| **Unreduced Early Retirement Eligibility** | The participant will be eligible to retire with an unreduced benefit prior to their Normal Retirement Age when the sum of their age and Credited Service equals |
| **Early Retirement Age** | Age 50 with at least 20 years of Credited Service. |
| **Early Retirement Benefit** | The actuarial equivalent of a benefit calculated in the same manner as the Normal Retirement Benefit with Final Average Compensation and Credited Service determined as of the Early Retirement Date. |
| **Late Retirement Benefit** | If a member remains employed after his Normal Retirement Date, he will receive a monthly benefit equal to the benefit computed using service and pay as of his late retirement date. Benefits commence on the first day of the month following actual retirement. |

# Summary of Plan Provisions

**Pre-Retirement Death Benefit**

The Surviving Spouse of a Participant who is actively employed and has satisfied Early or Normal Retirement eligibility requirements is entitled to a Death Benefit determined as if the Participant had retired on his date of death, selected a Joint & 2/3 Survivor Annuity and died the next day.

The Surviving Spouse of any other actively employed vested participant is entitled to a Death Benefit determined as follows:

i) assume the Participant separated from service on date of death
ii) survived to the earliest possible retirement eligibility date
iii) retired with a Joint and 2/3 Survivor Annuity, and
iv) dies the next day

**Vested Termination**

Members who terminate employment are eligible for a monthly benefit calculated in the same manner as the Normal Retirement Benefit, multiplied by the applicable vesting percentage:

| Sum of Attained Age & Years of Service | Vesting Percentage |
|---|---|
| 50 | 50% |
| 51 | 60% |
| 52 | 70% |
| 53 | 80% |
| 54 | 90% |
| 55 and after | 100% |

However, if a participant has at least 8 years of Credited Service, then they are fully vested.

**Refund of Contributions**

If a participant terminates employment without a vested benefit, then the participant will receive a refund of contributions with interest. If the sum of benefit payments received by a retiree or beneficiary is less than the sum of contributions with interest, then the difference may be paid to their beneficiary as an additional death benefit.

**Optional Forms of Payment**

Life Annuity
Joint & 50% Survivor Annuity
Joint & (2/3)% Survivor Annuity
Joint & 100% Survivor Annuity

# Distribution of Active Members by Age and by Years of Service

## Number of Participants by Age-Service Groups

| | Years of Service | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Attained Age** | **Under 1** | | **1 to 4** | | **5 to 9** | | **10 to 14** | | **15 to 19** | | **20 to 24** | | **25 to 29** | | **30 to 34** | | **35 to 39** | | **40 and up** | | **Total** | |
| | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** | **No.** | **Avg. Comp** |
| Under 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 to 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 to 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 to 39 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | N/A | 1 | N/A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | N/A |
| 40 to 44 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | N/A | 1 | N/A | 1 | N/A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | N/A |
| 45 to 49 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | N/A | 1 | N/A | 2 | N/A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 86,568 |
| 50 to 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | N/A | 7 | 104,655 | 2 | N/A | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 86,955 |
| 55 to 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | N/A | 2 | N/A | 2 | N/A | 0 | 0 | 0 | 0 | 8 | 75,792 |
| 60 to 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | N/A | 0 | 0 | 0 | 0 | 1 | N/A | 1 | N/A | 0 | 0 | 4 | N/A |
| 65 to 69 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | N/A | 0 | 0 | 0 | 0 | 1 | N/A | 0 | 0 | 0 | 0 | 0 | 0 | 2 | N/A |
| 70 and up | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 79,277 | 8 | 65,339 | 14 | 91,490 | 5 | 78,979 | 3 | N/A | 1 | N/A | 0 | 0 | 36 | 83,241 |

**Average Age** 53.5

**Average Service** 22.1

# Inactive Participants - Summary by Age

### Deferred Vested Participants

| Age Group | No. of | Total Monthly Benefit Amount | Average Monthly Benefit Amount |
|---|---|---|---|
| Less than 30 | 0 | $0 | $0 |
| 30 - 34 | 0 | 0 | 0 |
| 35 - 39 | 1 | 939 | 939 |
| 40 - 44 | 5 | 3,466 | 693 |
| 45 - 49 | 3 | 2,751 | 917 |
| 50 - 54 | 4 | 4,502 | 1,126 |
| 55 - 59 | 8 | 8,144 | 1,018 |
| 60 and over | 8 | 6,281 | 785 |
| Total | 29 | 26,083 | 899 |

### Retired Participants

| Age Group | No. of | Total Monthly Benefit Amount | Average Monthly Benefit Amount |
|---|---|---|---|
| Less than 55 | 2 | $5,106 | $2,553 |
| 55 - 59 | 7 | 20,102 | 2,872 |
| 60 - 64 | 13 | 32,310 | 2,485 |
| 65 - 70 | 21 | 45,132 | 2,149 |
| 70 - 75 | 11 | 16,633 | 1,512 |
| 75 - 80 | 15 | 19,815 | 1,321 |
| 80 and over | 12 | 14,472 | 1,206 |
| Total | 81 | 153,570 | 1,896 |

## Summary of Changes in Member Data

| | Active Participants | Retired Participants | Terminated Vested Participants | Total |
|---|---|---|---|---|
| **Count as of July 1, 2018** | 40 | 78 | 29 | 147 |
| New Entrants | 0 | 0 | 0 | 0 |
| Rehired | 0 | 0 | 0 | 0 |
| Retired | (3) | 3 | 0 | 0 |
| Lump Sum Payouts | (1) | 0 | 0 | (1) |
| Died with Beneficiary | 0 | 0 | 0 | 0 |
| New Alternate Payees | 0 | 0 | 0 | 0 |
| New Beneficiaries | 0 | 0 | 0 | 0 |
| Died without Beneficiary | 0 | 0 | 0 | 0 |
| Certain Period Expired | 0 | 0 | 0 | 0 |
| Terminated with Vesting | 0 | 0 | 0 | 0 |
| Terminated without Vesting | 0 | 0 | 0 | 0 |
| Data Corrections | 0 | 0 | 0 | 0 |
| Total Changes | (4) | 3 | 0 | (1) |
| **Count as of July 1, 2019** | 36 | 81 | 29 | 146 |

# Actuarial Standard of Practice 51 (ASOP 51)

The purpose of this section is to identify, assess, and provide illustrations of risks that are significant to the Plan, and in some cases to the Plan's participants.

The results of the actuarial valuation are based on one set of reasonable assumptions. However, it is almost certain that future experience will not exactly match the assumptions. As an example, investments may perform better or worse than assumed in any single year and over any longer time horizon. It is therefore important to consider the potential impacts of these potential differences when making decisions that may affect the future financial health of the Plan, or of the Plan's participants.

In addition, as plans mature they accumulate larger pools of assets and liabilities. This increases the potential risk to plan funding and the finances of those who are responsible for plan funding. As an example, it is more difficult for a plan sponsor to deal with the effects of a 10% investment loss on a plan with $1 Billion in assets and liabilities than if the same plan sponsor is responsible for a 10% investment loss on a plan with $1 Million in assets and liabilities. Since pension plans make long-term promises and rely on long-term funding, it is important to consider how mature the plan is today, and how mature it may become in the future.

Actuarial Standard of Practice No. 51 (ASOP 51) addresses these issues by providing actuaries with guidance for assessing and disclosing the risk associated with measuring pension liabilities and the determination of pension plan contributions. Specifically, it directs the actuary to:

- Identify risks that may be significant to the plan.
- Assess the risks identified as significant to the plan.
- Disclose plan maturity measures and historical information that are significant to\ understanding the plan's risks.

ASOP 51 states that if in the actuary's professional judgment, a more detailed assessment would be significantly beneficial in helping the individuals responsible for the plan to understand the risks identified by the actuary, then the actuary should recommend that such an assessment be performed.

This appendix uses the framework of ASOP 51 to communicate important information about: significant risks to the Plan, the Plan's maturity, and relevant historical Plan data.

# Actuarial Standard of Practice 51 (ASOP 51)

**Maturity Risk**

Definition: This is the potential for total plan liabilities to become more heavily weighted toward inactive liabilities over time.

Identification: The Plan is subject to maturity risk because as Plan assets and liabilities continue to grow, the impact of any gains or losses on the assets or liabilities also becomes larger.

Assessment: Currently assets are equal to 19 times last year's contributions indicating a one-year asset loss of 10% would be equal to 1.9 times last year's contributions.

**Retirement Risk**

Definition: This is the potential for participants to retire and receive subsidized benefits more valuable than expected.

Identification: This plan has valuable early retirement benefits. If participants retire at earlier ages than anticipated by the actuarial assumptions, it is expected that additional funding will be required.

**Investment Risk**

Definition: The potential that investment returns will be different than expected.

Identification: To the extent that actual investment returns differ from the assumed investment return, the plan's future assets, funding contributions and funded status may differ significantly from those presented in this valuation.

**Interest Rate Risk**

Definition: The potential that interest rates will be different than expected.

Identification: The pension liabilities reported herein have been calculated by computing the present value of expected future benefit payments using the interest rate(s) described in the report. If interest rate(s) in future valuations are different from those used in this valuation, future pension liabilities, funding contributions and funded status may differ significantly from those presented in this valuation. As a general rule, using a higher interest rate to compute the present value of future benefit payments will result in a lower pension liability, and vice versa. One aspect that can be used to estimate the impact of different interest rates is the plan's

Assessment: If the interest rate changes by 1%, the estimated percentage change in pension liability is approximately 10%.

# Actuarial Standard of Practice 51 (ASOP 51)

**Demographic Risks**

Definition: The potential that mortality or other demographic experience will be different than expected.

Identification: The pension liabilities reported herein have been calculated by assuming that participants will follow patterns of demographic experience (e.g. mortality, withdrawal, disability, retirement, form of payment election, etc.) as described in the appendix. If actual demographic experience or future demographic assumptions are different from what is assumed to occur in this valuation, future pension liabilities, funding contributions and funded status may differ significantly from those presented in this valuation.

# Glossary of Terms

| | |
|---|---|
| **Actuarial Liability** | The difference between the actuarial present value of all Fund benefits and the actuarial value of future normal costs. Also referred to as "actuarial accrued liability." |
| **Actuarial Assumptions** | Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation. |
| **Actuarial Cost Method** | A mathematical budgeting procedure of allocating the dollar amount of the actuarial present value of retirement fund benefit between future normal cost and actuarial accrued liability. Sometimes referred to as the "actuarial funding method." |
| **Experience Gain (Loss)** | The difference between actual experience and anticipated experience based on the actuarial assumptions during the period between two actuarial valuation dates. |
| **Actuarial Present Value** | The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment. |
| **Amortization** | Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with a lump sum payment. |
| **Normal Cost** | The actuarial present value of retirement fund benefits allocated to the current year by the actuarial cost method. |
| **Unfunded Actuarial Liability** | The difference between actuarial liability and the valuation assets.<br><br>Most retirement systems have unfunded actuarial liability. They arise each time new benefits are added, each time an actuarial loss is realized and when actuarial assumptions are modified. |
| **Accumulated Benefits** | Sometimes referred to as Accrued Benefits. These are the benefits that have been earned by all plan members as of the valuation date. |
| **Actuarially Determined Contribution** | This is the annual contribution determined in accordance with a plan's funding policy - typically the sum of the Normal Cost and an Amortization payment towards the Unfunded Actuarial Liability. |