# ARIZONA ELECTED OFFICIALS' RETIREMENT PLAN

## CONSOLIDATED REPORT

ACTUARIAL VALUATION
AS OF JUNE 30, 2019

CONTRIBUTIONS APPLICABLE TO THE
PLAN/FISCAL YEAR ENDING JUNE 30, 2021

FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

November 22, 2019

Board of Trustees
Arizona Elected Officials' Retirement Plan
Phoenix, AZ

*Re: Actuarial Valuation Report as of June 30, 2019 – Arizona Elected Officials' Retirement Plan*

Dear Members of the Board:

We are pleased to present to the Board this report of the annual actuarial valuation of the Arizona Elected Officials' Retirement Plan (EORP). The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits and to develop the appropriate funding requirements for the applicable plan year.

This report was prepared at the request of the Board and is intended for use by EORP and those designated or approved by the Board. This report may be provided to parties other than EORP only in its entirety and only with the permission of the Board. Foster & Foster is not responsible for the unauthorized use of this report.

The valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board, and reflects laws and regulations issued to date pursuant to the provisions of Title 38, Chapter 5, Article 3 of the Arizona Revised Statutes, as well as applicable federal laws and regulations. In our opinion, the assumptions used in this valuation, as adopted by the Board of Trustees, represent reasonable expectations of anticipated plan experience. Future actuarial measurements may differ significantly from the current measurements presented in this report for a variety of reasons including: changes in applicable laws, changes in plan provisions, changes in assumptions, or plan experience differing from expectations. Due to the limited scope of the valuation, we did not perform an analysis of the potential range of such future measurements.

The computed contribution rates shown in the "Contribution Results" section should be considered minimum contribution rates that comply with the Board's funding policy and Arizona Statutes. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, we suggest that contributions to the Plan in excess of those presented in this report be considered.

In conducting the valuation, we have relied on personnel, plan design, and asset information supplied by EORP through June 30, 2019 and the actuarial assumptions and methods described in the Actuarial Assumptions section of this report. While we cannot verify the accuracy of all this information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy of the information and believe that it has produced appropriate results. This information, along with any adjustments or modifications, is summarized in various sections of this report.

The actuary summarizes and tabulates population data in order to analyze longer-term trends. The following schedules were prepared by the actuary and provided separately to the administrative staff to be included in the "Actuarial Section" of the June 30, 2019 CAFR:

- Aggregate Actuarial Balance Sheet for EORP as of June 30, 2019
- EORP Mortality Rates as of June 30, 2019
- EORP Future Life Expectancy (Years) as of June 30, 2019
- Summary of Valuation Assumptions
- EORP Year of Service to Valuation Date
- EORP Retirees & Beneficiaries 2019

This valuation assumes the continuing ability of the participating employers to make the contributions necessary to fund this plan. A determination regarding whether or not the participating employers are actually able to do so is outside our scope of expertise. Consequently, we did not perform such an analysis.

The undersigned are familiar with the immediate and long-term aspects of pension valuations and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All of the sections of this report are considered an integral part of the actuarial opinion.

To our knowledge, no associate of Foster & Foster, Inc. working on valuations of the program has any direct financial interest or indirect material interest in the Arizona Elected Officials' Retirement Plan, nor does anyone at Foster & Foster, Inc. act as a member of the Board of Trustees of the Arizona Elected Officials' Retirement Plan. Thus, there is no relationship existing that might affect our capacity to prepare and certify this actuarial report.

If there are any questions, concerns, or comments about any of the items contained in this report, please contact us at 239-433-5500.

Respectfully Submitted,

Foster & Foster, Inc.

By: ______________________
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By: ______________________
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# I. Summary of Report

The regular annual actuarial valuation of the Arizona Elected Officials' Retirement Plan, performed as of June 30, 2019, has been completed and the results are presented in this Report. The purpose of this valuation is to:

- Compute the liabilities associated with benefits likely to be paid on behalf of current retired and active members. This information is contained in the section entitled "Liability Support."
- Compare accumulated assets with the liabilities to assess the funded condition. This information is contained in the section entitled "Liability Support."
- Compute the employers' statutory contribution rates for the Fiscal Year beginning July 1, 2020. This information is contained in the section entitled "Contribution Results."

### 1. Key Valuation Results

The funded status as of June 30, 2019 and the statutory employer contribution amounts applicable to the plan/fiscal year ending June 30, 2021 are as follows:

| | Pension | Health | Total |
|---|---|---|---|
| Employer Contribution Rate * | 55.21% | 0.00% | 55.21% |
| Funded Status | 31.5% | 176.4% | 33.6% |

### 2. Comparison of Key Results to Prior Year

The chart below compares the results from this valuation with the results of the prior year's valuation. Note that both here and throughout this report, all references to the June 30, 2018 were taken from the report prepared by GRS Retirement Consulting.

**Contribution Rate ***

| Valuation Date | Pension | Health | Total |
|---|---|---|---|
| June 30, 2018 | 61.43% | 0.00% | 61.43% |
| June 30, 2019 | 55.21% | 0.00% | 55.21% |

**Funded Status**

| Valuation Date | Pension | Health | Total |
|---|---|---|---|
| June 30, 2018 | 31.3% | 181.3% | 33.5% |
| June 30, 2019 | 31.5% | 176.4% | 33.6% |

** The rates shown are the calculated rates as of the valuation date.*

## 3. Reasons for Change

Changes in the results from the prior year's valuation are illustrated in the following tables along with high-level explanations below:

**Contribution Rate**

| | Pension | Health |
|---|---|---|
| Contribution Rate Last Valuation | 61.43% | 0.00% |
| Asset Experience | 0.24% | 0.02% |
| Liability Experience | (3.95%) | 0.08% |
| Payroll Base | (4.96%) | 0.04% |
| Assumption/Method Change | 0.95% | 0.02% |
| Other | 1.50% | (0.16%) |
| Contribution Rate This Valuation | 55.21% | 0.00% |

**Funded Status**

| | Tier 1 & Tier 2 | |
|---|---|---|
| | Pension | Health |
| Funded Status Last Valuation | 31.3% | 181.3% |
| Asset Experience | (0.3%) | (1.4%) |
| Liability Experience | (0.3%) | (1.3%) |
| Assumption/Method Change | (0.1%) | (0.4%) |
| Other | 0.9% | (1.8%) |
| Funded Status This Valuation | 31.5% | 176.4% |

**Assets Experience** – Asset gains and losses (relative to the assumed earnings rate) are smoothed over seven years. The return on the market value of assets for the year ending June 30, 2019 was 5.1%. On a smoothed, actuarial value of assets basis, however, the average return was 6.4%. This fell short of the 2018 assumed earnings rate of 7.4%.

**Liability Experience** – Experience overall was unfavorable, driven by greater than expected salaries and active retirements. Gains from greater than expected terminations partially offset those losses.

**Payroll Base** – Under the current amortization policy, the contribution rate is developed based on a percentage of payroll. Payroll for this purpose includes members of this plan and defined contribution plans' members that would have been in this plan (EORP DC and ASRS DC). To the extent that overall payroll is lower/greater than last year's projected payroll, the contribution rate will increase / decrease as a result. The proper inclusion of the ASRS DC payroll this year resulted in a significant increase in the total payroll and led to a sizable decrease in the contribution rate.

**Assumption / Method Change** – The interest rate (assumed earnings rate) was decreased from 7.40% to 7.30% and the mortality tables were updated to the latest available information. These changes both resulted in liability losses.

**Other** – This is the combination of all other factors that could impact liabilities year-over-year, with the primary sources being COLA experience, the transition of actuarial services, and changes in member data.

## 4. Looking Ahead

The continuing effect of prior asset losses was dampened by the asset smoothing reflected in the actuarial value of assets. There remain unrecognized investment losses that will, in the absence of other gains, put upward pressure on the contribution rate next year.

If the June 30, 2019 pension valuation results were based on the market value of assets instead of the actuarial value of assets, the pension funded percentage would be 30.1% (instead of 31.5%) and the statutory employer contribution requirement would be 56.41% of payroll (instead of 55.21%).

## 5. Conclusion

This plan is closed to new hires and relies on a statutory contribution that amortizes unfunded liabilities over a period that is much too long for the active membership. The contributions are based on the combined payroll of both current active members and defined contribution members that would have been part of this plan (EORP DC and ASRS DC). Two implications of this funding policy are that:

- Members who are not benefitting are helping to cover the cost of benefits (intergenerational equity).
- The assumption of continued payroll growth results in short-term growth in the unfunded liability and could significantly backload funding to the plan if the assumed growth (3.50% annually) is not achieved.

Adoption of methods typically used by a closed defined benefit plan would result in significant increases to the contribution rate. We recommend a review of the funding policy, considering the period of amortization, the sources of funding and the expected payroll growth, to ensure the Plan is on a viable path.

# II. CONTRIBUTION RESULTS

## Contribution Requirements

| Development of Employer Contributions | | | | |
|---|---|---|---|---|
| Valuation Date | June 30, 2019 | | June 30, 2018 | |
| Applicable to Fiscal Year Ending | 2021 | | 2020 | |
| | **Rate** | **Dollar** | **Rate** | **Dollar** |
| **Pension** | | | | |
| Normal Cost | | | | |
| Total Normal Cost | 27.40% | | | |
| Employee Cost | (7.00%) | | | |
| Employer (Net) Normal Cost | 20.40% | | 21.71% | |
| Amortization of Unfunded Liability | 57.44% | | 62.83% | |
| Total Statutory Contribution Rate | 77.84% | $ 50,396,359 | 84.54% | |
| Statutory Employer Contribution Rate | 55.21% | | 61.43% | |
| **Board Approved Employer Contribution Rate *** | **61.43%** | | **61.43%** | |
| **Health** | | | | |
| Normal Cost | 0.63% | | 0.49% | |
| Amortization of Unfunded Liability | (0.63%) | | (0.49%) | |
| Total Employer Cost (Health) | 0.00% | $ 0 | 0.00% | |

As outlined in Section 38-810 of the Arizona Revised Statutes, the contribution rate, effective July 1, 2018, is determined actuarially as a combination of normal cost and an amortization of the plan's unfunded liability. This results in the "Total Statutory Contribution Rate" above. The statutes also outline that additional sources of funding will be provided through court fees (approximately $11 million in 2019) and appropriation ($5 million each year through fiscal 2043). The "Statutory Employer Contribution Rate" nets out this additional funding from the total rate to arrive at an employer rate to be paid by the combined payrolls for members that would have been in this plan had it not been closed (EORP defined benefit, EORP defined contribution, and ASRS defined contribution members).

* *The Board decided to keep the Employer contribution rate (as calculated with the June 30, 2018 valuation) for the fiscal year ending June 30, 2021.*

## Historical Summary of Employer Pension Rates

| Valuation Date June 30 | Fiscal Year Ending June 30 | Normal Cost | Unfunded Amortization | Total * |
|---|---|---|---|---|
| 2018 | 2020 | 21.71% | 39.72% | 61.43% |
| 2019 | 2021 | 20.40% | 41.03% | 61.43% |

** Percent applied to combined DB/DC payroll and added to fees and $5 million appropriation.*

## Historical Summary of Recommended Employer Health Rates

| Valuation Date June 30 | Fiscal Year Ending June 30 | Normal Cost | Unfunded Amortization | Total |
|---|---|---|---|---|
| 2018 | 2020 | 0.49% | (0.49%) | 0.00% |
| 2019 | 2021 | 0.63% | (0.63%) | 0.00% |

# III. Liability Support

## Liabilities and Funded Ratios by Benefit

| | June 30, 2019 | June 30, 2018 |
|---|---|---|
| **Pension** | | |
| Actuarial Present Value of Benefits | | |
| Retirees and Beneficiaries | $ 721,454,926 | |
| Vested Members | 9,901,196 | |
| Active Members | 297,295,886 | |
| Total Actuarial Present Value of Benefits | 1,028,652,008 | |
| Actuarial Accrued Liability (AAL) | | |
| All Inactive Members | 731,356,122 | |
| Active Members | 217,885,882 | |
| Total Actuarial Accrued Liability | 949,242,004 | 904,884,325 |
| Actuarial Value of Assets (AVA) | 298,895,212 | 283,453,428 |
| Unfunded Actuarial Accrued Liability | 650,346,792 | 621,430,897 |
| Funded Ratio (AVA / AAL) | 31.5% | 31.3% |
| **Health** | | |
| Present Value of Benefits | | |
| Retirees and Beneficiaries | $ 11,253,880 | |
| Active Members | 4,464,288 | |
| Total Present Value of Benefits | 15,718,168 | |
| Actuarial Accrued Liability (AAL) | | |
| Retirees and Beneficiaries | 11,253,880 | |
| Active Members | 2,795,336 | |
| Total Actuarial Accrued Liability | 14,049,216 | 13,392,662 |
| Actuarial Value of Assets (AVA) | 24,785,950 | 24,287,431 |
| Unfunded Actuarial Accrued Liability | (10,736,734) | (10,894,769) |
| Funded Ratio (AVA / AAL) | 176.4% | 181.3% |

# Derivation of Experience (Gain)/Loss

Actual experience will never exactly match assumed experience, except by coincidence. Ideally, gains and losses will cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience (gain) / loss is shown below, along with sources of the gains and losses.

| | | Pension | Health |
|---|---|---|---|
| (1) | Unfunded Actuarial Accrued Liability as of June 30, 2018 | $ 621,430,897 | $ (10,894,769) |
| (2) | Normal Cost Developed in Last Valuation | 10,417,818 | 235,133 |
| (3) | Actual Contributions | 58,150,588 | - |
| (4) | Expected Interest On (1), (2), and (3) | 44,643,629 | (788,813) |
| (5) | Expected Unfunded Actuarial Accrued Liability as of June 30, 2019 (1)+(2)-(3)+(4) | 618,341,756 | (11,448,449) |
| (6) | Changes to UAAL Due to Assumptions, Methods and Benefits | 4,169,779 | 33,045 |
| (7) | Change to UAAL Due to Actuarial (Gain)/Loss | 27,835,257 | 678,670 |
| (8) | Unfunded Actuarial Accrued Liability as of June 30, 2019 | 650,346,792 | (10,736,734) |

## FY 2019 Gains and Losses by Source

| | Pension | | Health | |
|---|---|---|---|---|
| | (Gain) / Loss | % of Liabilities | (Gain) / Loss | % of Liabilities |
| Investment Return | 2,692,448 | 0.3% | 192,512 | 1.4% |
| Salary Increases | 8,051,167 | 0.8% | - | 0.0% |
| Retirement | 3,624,496 | 0.4% | 109,412 | 0.8% |
| Turnover | (2,832,326) | (0.3%) | (26,675) | (0.2%) |
| Disability | (99,196) | 0.0% | (4,764) | 0.0% |
| Death-In-Service | 12,453 | 0.0% | (1,117) | 0.0% |
| Retiree Mortality | 141,175 | 0.0% | 25,474 | 0.2% |
| Other * | 16,245,040 | 1.7% | 383,828 | 2.6% |
| Total | 27,835,257 | 2.9% | 678,670 | 4.8% |

* *The combination of all other factors that could impact liabilities year-over-year, with the primary sources being COLA experience, the transition of actuarial services, and changes in member data.*

# Amortization of Unfunded Liabilities

| | Pension | Health |
|---|---|---|
| Unfunded Liability to Amortize | | |
| Unfunded Actuarial Accrued Liability | 650,346,792 | (10,736,734) |
| Maintenance of Effort | 7,296,122 | - |
| Anticipated Contribution Towards Unfunded | 46,055,782 | - |
| Unfunded Liability to Amortize [1] | 657,672,638 | (11,520,516) |
| Amortization Period | 25 | 20 |
| Projected Payroll [2] | 70,701,952 | 70,701,952 |
| Rate of Amortization of Unfunded Liability | 57.44% | (1.16%) |

[1] *Adjusted with interest to beginning of next fiscal year*

[2] *Payroll for this purpose is a combination of payroll for all members who would have joined the plan had it not been closed to new entrants. This includes current active members of this plan and defined contribution members of EORP and ASRS.*

# IV. ASSET SUPPORT

## Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2019

Market Value Basis

| | Pension | Health |
|---|---|---|
| **Additions** | | |
| Contributions | | |
| Member Contributions | $ 4,281,004 | $ - |
| Employer Contributions | 42,206,970 | - |
| Health Insurance Contributions | - | - |
| Other Contributions | 15,943,618 | - |
| Total Contributions | 62,431,592 | - |
| Investment Income | | |
| Net Increase in Fair Value | 10,901,492 | 917,988 |
| Interest and Dividends | 2,913,689 | 245,356 |
| Other Income | 2,150,872 | 181,120 |
| Less Investment Expenses | (1,590,259) | (133,912) |
| Net Investment Income | 14,375,794 | 1,210,552 |
| Transfers In | - | - |
| Total Additions | 76,807,386 | 1,210,552 |
| **Deductions** | | |
| Distributions to Members | | |
| Benefit Payments | 64,857,634 | - |
| Health Insurance Subsidy | - | 1,066,768 |
| Refund of Contributions | 266,428 | - |
| Total Distributions | 65,124,062 | 1,066,768 |
| Administrative Expenses | 317,533 | 26,739 |
| Transfers Out | 47,474 | - |
| Other | - | - |
| Total Deductions | 65,489,069 | 1,093,507 |
| **Net Increase / (Decrease)** | 11,318,317 | 117,045 |
| **Net Position Held in Trust** | | |
| Prior Valuation | 274,746,486 | 23,726,589 |
| End of the Year | 286,064,803 | 23,843,634 |

# Development of Pension Actuarial Value of Assets

| **A. Investment Income** | |
|---|---|
| A1. Actual Investment Income | $ 14,058,261 |
| A2. Expected Amount for Immediate Recognition | 20,875,985 |
| A3. Amount Subject to Amortization | (6,817,724) |

| | Year Ended June 30 | | | | | | |
|---|---|---|---|---|---|---|---|
| **B. Amortization Schedule** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** |
| 2019 Experience (A3 / 7) | (973,961) | (973,961) | (973,961) | (973,961) | (973,961) | (973,961) | (973,958) |
| 2018 Experience | (198,529) | (198,529) | (198,529) | (198,529) | (198,529) | (198,532) | |
| 2017 Experience | 1,448,275 | 1,448,275 | 1,448,275 | 1,448,275 | 1,448,276 | | |
| 2016 Experience | (3,206,762) | (3,206,762) | (3,206,762) | (3,206,763) | | | |
| 2015 Experience | (1,951,168) | (1,951,168) | (1,951,166) | | | | |
| 2014 Experience | 1,735,522 | 1,735,522 | | | | | |
| 2013 Experience | 452,366 | | | | | | |
| Total Amortization | (2,694,257) | (3,146,623) | (4,882,143) | (2,930,978) | 275,786 | (1,172,493) | (973,958) |

| **C. Actuarial Value of Assets** | |
|---|---|
| C1. Actuarial Value of Assets, 06/30/2018 | 283,453,428 |
| C2. Noninvestment Net Cash Flow | (2,739,944) |
| C3. Preliminary Actuarial Value of Assets, 06/30/2019 (A2 + B + C1 + C2) | 298,895,212 |
| C4. Market Value of Assets, 06/30/2019 | 286,064,803 |
| C5. Final Actuarial Value of Assets, 06/30/2019 (C3 Within 20% Corridor of C4) | 298,895,212 |

| **D. Rates of Return** | |
|---|---|
| D1. Market Value Rate of Return | 5.1% |
| D2. Actuarial Value Rate of Return | 6.4% |

# Development of Health Actuarial Value of Assets

| A. Investment Income | |
|---|---|
| A1. Actual Investment Income | $ 1,183,813 |
| A2. Expected Amount for Immediate Recognition | 1,758,504 |
| A3. Amount Subject to Amortization | (574,691) |

| | Year Ended June 30 | | | | | | |
|---|---|---|---|---|---|---|---|
| **B. Amortization Schedule** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** |
| 2019 Experience (A3 / 7) | (82,099) | (82,099) | (82,099) | (82,099) | (82,099) | (82,099) | (82,097) |
| 2018 Experience | (12,326) | (12,326) | (12,326) | (12,326) | (12,326) | (12,325) | |
| 2017 Experience | 118,122 | 118,122 | 118,122 | 118,122 | 118,119 | | |
| 2016 Experience | (236,920) | (236,920) | (236,920) | (236,922) | | | |
| 2015 Experience | (138,912) | (138,912) | (138,912) | | | | |
| 2014 Experience | 128,006 | 128,006 | | | | | |
| 2013 Experience | 30,912 | | | | | | |
| Total Amortization | (193,217) | (224,129) | (352,135) | (213,225) | 23,694 | (94,424) | (82,097) |

| C. Actuarial Value of Assets | |
|---|---|
| C1. Actuarial Value of Assets, 06/30/2018 | 24,287,431 |
| C2. Noninvestment Net Cash Flow | (1,066,768) |
| C3. Preliminary Actuarial Value of Assets, 06/30/2019 (A2 + B + C1 + C2) | 24,785,950 |
| C4. Market Value of Assets, 06/30/2019 | 23,843,634 |
| C5. Final Actuarial Value of Assets, 06/30/2019 (C3 Within 20% Corridor of C4) | 24,785,950 |

| D. Rates of Return | |
|---|---|
| D1. Market Value Rate of Return | 5.1% |
| D2. Actuarial Value Rate of Return | 6.6% |

# V. MEMBER STATISTICS

## 06/30/2019 Valuation Data Summary

| | |
|---|---|
| **Actives** | |
| Number | 485 |
| Average Current Age | 58.6 |
| Average Age at Employment | 46.5 |
| Average Past Service | 12.1 |
| Average Annual Salary | $98,941 |
| **Retirees** | |
| Number | 1,004 |
| Average Current Age | 72.5 |
| Average Annual Benefit | $55,908 |
| **Beneficiaries** | |
| Number | 220 |
| Average Current Age | 78.9 |
| Average Annual Benefit | $41,048 |
| **Disability Retirees** | |
| Number | 16 |
| Average Current Age | 70.6 |
| Average Annual Benefit | $107,433 |
| **Inactive / Vested** | |
| Number | 166 |
| Average Current Age | 56.2 |
| Average Accumulated Contributions | $13,532 |
| **Total Number** | 1,891 |

# Active Counts and Pay Summary by Service

| | Past Service | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **0-4** | **5-9** | **10-14** | **15-19** | **20-24** | **25-29** | **30+** | **Total Count** | **Total Pay** | **Average Pay** |
| <30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | $ - | $ - |
| 30 - 34 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 137,631 | 45,877 |
| 35 - 39 | 1 | 4 | 2 | 0 | 0 | 0 | 0 | 7 | 343,308 | 49,044 |
| 40 - 44 | 0 | 14 | 6 | 2 | 0 | 0 | 0 | 22 | 1,332,122 | 60,551 |
| 45 - 49 | 0 | 36 | 13 | 3 | 0 | 0 | 0 | 52 | 5,439,824 | 104,612 |
| 50 - 54 | 0 | 37 | 19 | 8 | 3 | 0 | 0 | 67 | 7,528,455 | 112,365 |
| 55 - 59 | 1 | 36 | 39 | 22 | 4 | 1 | 0 | 103 | 11,951,502 | 116,034 |
| 60 - 64 | 4 | 41 | 34 | 26 | 12 | 2 | 1 | 120 | 12,797,280 | 106,644 |
| 65+ | 1 | 34 | 36 | 19 | 9 | 9 | 3 | 111 | 8,456,142 | 76,181 |
| Total | 7 | 205 | 149 | 80 | 28 | 12 | 4 | 485 | $ 47,986,264 | $ 98,941 |

# VI. ACTUARIAL ASSUMPTIONS AND METHODS

| | |
|---|---|
| Interest Rate | 7.30% per year. This is the assumed earnings rate on System assets, compounded annually, net of investment and administrative expenses. |
| Salary Increases | 3.75%. This is annual increase for individual member's salary. This rate, which is based on a 2017 experience study using actual plan experience, consist of 3.5% for wage inflation and 0.25% for merit / seniority increases. |
| Inflation | 2.50%. |
| Cost-of-Living Adjustment | 1.75%. |
| Mortality Rates | These rates are used to project future decrements from the population due to death.<br><br>***Active Lives***<br>PubG-2010 Employee mortality, projected with future mortality improvements reflected generationally using 75% of scale MP-2018.<br><br>***Inactive Lives***<br>PubG-2010 Healthy Retiree mortality, projected with future mortality improvements reflected generationally using 75% of scale MP-2018.<br><br>***Beneficiaries***<br>PubG-2010 Survivor mortality, projected with future mortality improvements reflected generationally using 75% of scale MP-2018.<br><br>***Disabled Lives***<br>PubG-2010 Disabled mortality, projected with future mortality improvements reflected generationally using 75% of scale MP-2018.<br><br>The mortality assumptions sufficiently accommodate anticipated future mortality improvements. |
| Retirement Rates | These rates are used to project future decrements from the active population due to retirement. The rates below are based on a 2017 experience study using actual plan experience. |

***Applicable to Tier 1 Members Reaching Age 62 Before Attaining 20 Years of Service***

Age-related rates based on age at retirement: 15% per year from age 62 - 74 and 100% assumed at age 75.

***Applicable to Tier 1 Members Reaching Age 62 After Attaining 20 Years of Service***

Service-related rates based on service at retirement: 40% per year with 20 years of service, 30% per year with 21 years of service, 15% per year with 22-34 years of service, and 100% assumed with 35+ years of service.

***Applicable to Tier 1 Members Eligible For Early Retirement***

3.5% per year for each year of eligibility.

***Applicable to Tier 2 Members***

Age-related rates based on age at retirement.

| Age | Rate |
|---|---|
| 62 | 40% |
| 63 | 30% |
| 64 | 20% |
| 65-66 | 15% |
| 67-68 | 45% |
| 69 | 15% |
| 70+ | 100% |

Termination Rates

These rates are used to project future decrements from the active population due to termination. Service-related rates based on service at termination: 5.50% per year for up to 10 years of service, 2.50% per year for 11-20 years of service, and 2.00% per year for 21+ years of service. These rates are based on a 2017 experience study using actual plan experience.

Disability Rates

These rates are used to project future decrements from the active population due to disability. Sample age-related rates based on age at disability are provided below. These rates are based on a 2017 experience study using actual plan experience.

| Age | Rate |
|---|---|
| 30 | 0.00% |
| 35 | 0.00% |
| 40 | 0.00% |
| 45 | 0.00% |
| 50 | 0.13% |
| 55 | 0.17% |

| | |
|---|---|
| Marital Status | For active members, 80% of males and 70% of females are assumed to be married. Actual marital status is used, where applicable, for inactive members. |
| Spouse's Age | Males are assumed to be three years older than females. |
| Health Care Utilization | For active members, 70% of retirees are expected to utilize retiree health care. Actual utilization is used for inactive members. |
| Funding Method | Entry Age Normal Cost Method. |
| Actuarial Asset Method | Each year the assumed investment income is recognized in full while the difference between actual and assumed investment income are smoothed over a 7-year period subject to a 20% corridor around the market value. During periods when investment performance exceeds (falls short) of the assumed rate, the actuarial value of assets will tend to be less (greater) than the market value of assets. |
| Funding Policy Amortization Method | Level Percentage of Payroll method over a closed period of 25 years. |
| Payroll Growth | 3.50% per year. This is annual increase for total employer payroll. |
| Stabilization Reserve | Beginning with the June 30, 2007 valuation and with each subsequent valuation, if the actuarial value of assets exceeds the actuarial accrued liability, one half of this excess in each year is allocated to a Stabilization Reserve. This Reserve is excluded from the calculation of the employer contribution rates. The Reserve accumulates as long as the plan is overfunded. Once the plan becomes underfunded, the Stabilization Reserve will be used to dampen increases in the employer contribution rates. |

**Changes to Actuarial Assumptions and Methods Since the Prior Valuation**

- The interest rate (assumed earnings rate) was lowered from 7.40% to 7.30%.
- The mortality rates were updated to reflect the PubG-2010 tables; previously, rates were based on the RP-2014 tables.

# VII. DISCUSSION OF RISK

ASOP No. 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions, states that the actuary should identify risks that, in the actuary's professional judgment, may reasonably be anticipated to significantly affect the plan's future financial condition.

Throughout this report, actuarial results are determined under various assumption scenarios. These results are based on the premise that all future plan experience will align with the plan's actuarial assumptions; however, there is no guarantee that actual plan experience will align with the plan's assumptions. Whenever possible, the recommended assumptions in this report reflect conservatism to allow for some margin of unfavorable future plan experience. However, it is still possible that actual plan experience will differ from anticipated experience in an unfavorable manner that will negatively impact the plan's funded position.

Below are examples of ways in which plan experience can deviate from assumptions and the potential impact of that deviation. Typically, this results in an actuarial gain or loss representing the current-year financial impact on the plan's unfunded liability of the experience differing from assumptions; this gain or loss is amortized over a period of time determined by the plan's amortization method. When assumptions are selected that adequately reflect plan experience, gains and losses typically offset one another in the long term, resulting in a relatively low impact on the plan's contribution requirements associated with plan experience. When assumptions are too optimistic, losses can accumulate over time and the plan's amortization payment could potentially grow to an unmanageable level.

- Investment Return: When the rate of return on the Actuarial Value of Assets falls short of the assumption, this produces a loss representing assumed investment earnings that were not realized. Further, it is unlikely that the plan will experience a scenario that matches the assumed return in each year as capital markets can be volatile from year to year. Therefore, contribution amounts can vary in the future.
- Salary Increases: When a plan participant experiences a salary increase that was greater than assumed, this produces a loss representing the cost of an increase in anticipated plan benefits for the participant as compared to the previous year. The total gain or loss associated with salary increases for the plan is the sum of salary gains and losses for all active participants.
- Payroll Growth: The plan's payroll growth assumption, if one is used, causes a predictable annual increase in the plan's amortization payment in order to produce an amortization payment that remains constant as a percentage of payroll if all assumptions are realized. If payroll does not increase according to the plan's payroll growth assumption, the plan's amortization payment can increase significantly as a percentage of payroll even if all assumptions other than the payroll growth assumption are realized.
- Demographic Assumptions: Actuarial results take into account various potential events that could happen to a plan participant, such as retirement, termination, disability, and death. Each of these potential events is assigned a liability based on the likelihood of the event and the financial consequence of the event for the plan. Accordingly, actuarial liabilities reflect a blend of financial consequences associated with various possible outcomes (such as retirement at one of various possible ages). Once the outcome is known (e.g. the participant retires) the liability is adjusted to reflect the known outcome. This adjustment

produces a gain or loss depending on whether the outcome was more or less favorable than other outcomes that could have occurred.

- Contribution risk: This risk results from the potential that actual employer contributions may deviate from actuarially determined contributions, which are determined in accordance with the Board's funding policy. The funding policy is intended to result in contribution requirements that if paid when due, will result in a reasonable expectation that assets will accumulate to be sufficient to pay plan benefits when due. Contribution deficits, particularly large deficits and those that occur repeatedly, increase future contribution requirements and put the plan at risk for not being able to pay plan benefits when due.

## IMPACT OF PLAN MATURITY ON RISK

For newer pension plans, most of the participants and associated liabilities are related to active members who have not yet reached retirement age. As pension plans continue in operation and active members reach retirement ages, liabilities begin to shift from being primarily related to active members to being shared amongst active and retired members. Plan maturity is a measure of the extent to which this shift has occurred. It is important to understand that plan maturity can have an impact on risk tolerance and the overall risk characteristics of the plan. For example, plans with a large amount of retired liability do not have as long of a time horizon to recover from losses (such as losses on investments due to lower than expected investment returns) as plans where the majority of the liability is attributable to active members. For this reason, less tolerance for investment risk may be warranted for highly mature plans with a substantial inactive liability. Similarly, mature plans paying substantial retirement benefits resulting in a small positive or net negative cash flow can be more sensitive to near term investment volatility, particularly if the size of the fund is shrinking, which can result in less assets being available for investment in the market.

To assist with determining the maturity of the plan, we have provided some relevant metrics in the table following titled "Plan Maturity Measures and Other Risk Metrics". Highlights of this information are discussed below:

- The Support Ratio, determined as the ratio of active to inactive members, has decreased from 42.8% on June 30, 2018 to 34.5% on June 30, 2019. This is expected since the plan is closed to new active members.
- The Accrued Liability Ratio, determined as the ratio of the Inactive Accrued Liability, which is the liability associated with members who are no longer employed but are due a benefit from the plan, to the Total Accrued Liability, is 77.0%. With a plan of this maturity, losses due to lower than expected investment returns or demographic factors will need to be made up for over a shorter time horizon than would be needed for a less mature plan.
- The Funded Ratio, determined as the ratio of the Actuarial Value of Assets to the Total Accrued Liability, has increased from 31.3% on June 30, 2018 to 31.5% on June 30, 2019, due mainly to plan experience including contributions. The contributions will need to continue at least at these statutory levels for the funded status to improve over time.
- The Net Cash Flow Ratio, determined as the ratio of the Net Cash Flow (contributions minus benefit payments) to the Market Value of Assets, was (0.9%) for the year ending June 30, 2019, meaning that contributions are not currently covering the plan's benefit payments.

It is important to note that the actuary has identified the risks above as the most significant risks based on the characteristics of the plan and the nature of the project, however, it is not an exhaustive list of potential risks that could be considered. Additional advanced modeling, as well as the identification of additional risks, can be provided at the request of the reader.

# Plan Maturity Measures and Other Risk Metrics

| | 06/30/2018 | 06/30/2019 |
|---|---|---|
| **Support Ratio** | | |
| Total Actives | 579 | 485 |
| Total Inactives | 1,353 | 1,406 |
| Actives / Inactives | 42.8% | 34.5% |
| **Asset Volatility Ratio** | | |
| Market Value of Assets (MVA) | | 286,064,803 |
| Total Annual Payroll | | 47,986,264 |
| MVA / Total Annual Payroll | | 596.1% |
| **Accrued Liability (AL) Ratio** | | |
| Inactive Accrued Liability | | 731,356,122 |
| Total Accrued Liability | | 949,242,004 |
| Inactive AL / Total AL | | 77.0% |
| **Funded Ratio** | | |
| Actuarial Value of Assets (AVA) | 283,453,428 | 298,895,212 |
| Total Accrued Liability | 904,884,325 | 949,242,004 |
| AVA / Total Accrued Liability | 31.3% | 31.5% |
| **Net Cash Flow Ratio** | | |
| Net Cash Flow * | | (2,692,470) |
| Market Value of Assets (MVA) | | 286,064,803 |
| Net Cash Flow / MVA | | (0.9%) |

* *Determined as total contributions minus benefit payments. Administrative expenses are typically included but are considered part of the net interest rate assumption for this plan.*

# VIII. Summary of Current Plan

The following is a summary of the benefit provisions provided in Title 38, Chapter 5, Article 3 of the Arizona Revised Statutes.

Membership

Eligible elected officials, justices, judges, and administrators who were members of the plan on December 31, 2013.

Benefit Tiers

Benefits differ for members based on their hire date:

| Tier | Hire Date |
|---|---|
| 1 | Hired before January 1, 2012 |
| 2 | Hired on or after January 1, 2012 |

Average Yearly Salary

Total salary paid during a considered period divided by the number of years (including fractional years) in which the salary was received.

***Tier 1***

Considered period is the three highest consecutive years within the last ten completed years of service.

***Tier 2***

Considered period is the five highest consecutive years within the last ten completed years of service.

Credited Service

Total periods of service, both from other State plans and those compensated periods of service for which the member made contributions to the Fund.

Normal Retirement Date

First of the month following attainment of 1) age 62 years with 10 years of Credited Service or 2) age 65 with 5 years of Credited Service. Members hired before January 1, 2012 are also eligible upon attainment of 20 years of Credited Service.

Benefit

***Tier 1***

4.00% times Average Yearly Salary times Credited Service (maximum 80% of Average Yearly Salary).

***Tier 2***

3.00% times Average Yearly Salary times Credited Service (maximum 75% of Average Yearly Salary).

| | |
|---|---|
| Form of Benefit | For married retirees, an annuity payable for the life of the member with 75% continuing to the eligible spouse upon death (50% for members hired on/after January 1, 2012). For unmarried retirees, the normal form is a single life annuity. |
| Early Retirement Eligibility | ***Only Applicable to Tier 1 Members***<br>5 years of Credited Service. |
| Benefit | Normal Retirement benefit reduced by 0.25% for each month Early Retirement precedes the member's Normal Retirement date. Maximum reduction is 30%. |
| Disability Benefit Eligibility | Permanent mental or physical incapacitation that would prevent the member from performing the duties of their office. |
| Benefit Amount | Percentage (below) times Average Yearly Salary. |

***Tier 1***

| Credited Service | Percentage |
|---|---|
| Less than 5 years | 20% |
| 5 years to less than 10 | 40% |
| 10+ years | 80% |

***Tier 2***

| Credited Service | Percentage |
|---|---|
| Less than 5 years | 18.75% |
| 5 years to less than 10 | 37.50% |
| 10+ years | 75.00% |

| | |
|---|---|
| Pre-Retirement Death Benefit | |
| Payable to Eligible Survivor | 75% (50% for members hired on/after January 1, 2012) of benefit calculated in same manner as disability benefit. Payable to eligible spouse for life; payable to eligible children until adopted, age 18, or age 23 if full-time student. |
| No Survivors | Accumulated contributions. |
| Vesting (Termination) Deferred Annuity | For those with 5 years of credited service, Normal Retirement Benefit is payable upon reaching age requirement if contributions are left in fund. |
| Return of Contributions | ***Tier 1***<br>Lump sum payment of accumulated contributions, plus additional amount based on years of credited service. |

Contributions left on deposit more than 30 days receive interest (as determined by the Board) from termination.

| Service | Additional % of Contributions |
|---|---|
| Less than 5 years | 0% |
| 5 years | 25% |
| 6 years | 40% |
| 7 years | 55% |
| 8 years | 70% |
| 9 years | 85% |
| 10+ years | 100% |

***Tier 2***

Lump sum payment of accumulated contributions, with interest at rate determined by the Board.

Cost-of-Living Adjustment

Compound cost-of-living adjustment on base benefit, payable to retired member or survivor of retired member. First payment is made on July 1, 2019, with annual adjustments effective every July 1 thereafter.

Cost-of-living adjustment will be based on the average annual percentage change in the Metropolitan Phoenix-Mesa Consumer Price Index published by the United States Department of Labor, Bureau of Statistics. Maximum increase of 2%.

Post-Retirement Health Insurance Subsidy

Eligibility

Retired member or survivor who elect health coverage provided by the state or participating employer.

Maximum Subsidy Amounts (Monthly)

| | Member Only | With Dependents |
|---|---|---|
| Medicare Eligible | $100 | $170 |
| One w/ Medicare | N/A | $215 |
| Not Medicare Eligible | $150 | $260 |

Retired members or survivors with at least five years of service, but less than 8 years of service receive a proportionate share of full subsidy.

Employee Contributions

***Tier 1***

7.00%

***Tier 2***

13.00%. Amounts in excess of 7.00% are not used to reduce the employer contribution ("maintenance of effort").

<u>Employer Contributions</u>

Normal Cost plus amortization of unfunded actuarial accrued liability over a closed period not to exceed 30 years. Total employer and employee contributions cannot be less than the normal cost.

**Changes to Benefit Provisions Since the Prior Valuation**

None.

# IV. Glossary

Actuarial Accrued Liability – Computed differently under different funding methods, the actuarial accrued liability generally represents the portion of the actuarial present value of benefits attributable to service credit earned (or accrued) as of the valuation date.

Actuarial Present Value of Benefits – Amount which, together with future interest, is expected to be sufficient to pay all benefits to be paid in the future, regardless of when earned, as determined by the application of a particular set of actuarial assumptions; equivalent to the actuarial accrued liability plus the present value of future normal costs attributable to the members.

Actuarial Assumptions – Assumptions as to the occurrence of future events affecting pension costs. These assumptions include rates of investment earnings, changes in salary, rates of mortality, withdrawal, disablement, and retirement as well as statistics related to marriage and family composition.

Actuarial Cost Method – A method of determining the portion of the cost of a pension plan to be allocated to each year; sometimes referred to as the "actuarial funding method." Each cost method allocates a certain portion of the actuarial present value of benefits between the actuarial accrued liability and future normal costs.

Actuarial Equivalence – Series of payments with equal actuarial present values on a given date when valued using the same set of actuarial assumptions.

Actuarial Present Value - The amount of funds required as of a specified date 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 payments between the specified date and the expected date of payment.

Actuarial Value of Assets – The value of cash, investments, and other property belonging to the pension plan as used by the actuary for the purpose of the actuarial valuation. This may correspond to market value of assets, or some modification using an asset valuation method to reduce the volatility of asset values.

Asset Gain (Loss) – That portion of the actuarial gain attributable to investment performance above (below) the expected rate of return in the actuarial assumptions.

Amortization – Paying off an interest-discounted amount with periodic payments of interest and (generally) principal, as opposed to paying off with a lump sum payment.

Amortization Payment – That portion of the pension plan contribution designated to pay interest and reduce the outstanding principal balance of unfunded actuarial accrued liability. If the amortization payment is less than the accrued interest on the unfunded actuarial accrued liability the outstanding principal balance will increase.

Assumed Earnings Rate – The interest rate used in developing present values to reflect the time value of money.

Decrements – Events which result in the termination of membership in the system such as retirement, disability, withdrawal, or death.

Entry Age Normal (EAN) Funding Method – A standard actuarial funding method whereby each member's normal costs (service costs) are generally level as a percentage of pay from entry age until retirement. The annual cost of benefits is comprised of the normal cost plus an amortization payment to reduce the UAL.

Experience Gain (Loss) – The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities during the period between two valuation dates. It is a measurement of the difference between actual and expected experience, and may be related to investment earnings above (or below) those expected or changes in the liability due to fewer (or greater) than expected numbers of retirements, deaths, disabilities, or withdrawals, or variances in pay increases relative to assumed pay increases. The effect of such gains (or losses) is to decrease (or increase) future costs.

Funded Ratio – A measure of the ratio of the actuarial value of assets to liabilities of the system. Typically, the assets used in the measure are the actuarial value of assets as determined by the asset valuation method. The funded ratio depends not only on the financial strength of the plan but also on the asset valuation method used to determine the assets and on the funding method used to determine the liabilities.

Market Value of Assets (MVA) – The value of assets as they would trade on an open market.

Normal Cost – Computed differently under different funding methods, generally that portion of the actuarial present value of benefits allocated to the current plan year.

Unfunded Actuarial Accrued Liability (UAAL) – The excess of the actuarial accrued liability over the valuation assets; sometimes referred to as "unfunded past service liability". UAL increases each time an actuarial loss occurs and when new benefits are added without being fully funded initially and decreases when actuarial gains occur.