# Arizona Corrections Officer Retirement Plan Consolidated Report

June 30, 2018

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December 14, 2018

Board of Trustees
Arizona Corrections Officer Retirement Plan
Phoenix, Arizona

**Re: Arizona Corrections Officer Retirement Plan Actuarial Valuation as of June 30, 2018**

Dear Board Members:

The results of the June 30, 2018 annual actuarial valuation of members covered by the Arizona Corrections Officer Retirement Plan (CORP) are presented in this report.

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

The purpose of this valuation is to measure the Retirement Plan's funding progress and to determine the employer contribution for the 2019-2020 fiscal year. The funding objective is stated in Article 4, Chapter 5, Title 38, Section 891A of the Arizona Revised Statutes. In addition, this consolidated report provides summary information for CORP participating employers. This report should not be relied on for any other purpose. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

The computed contribution rate shown on page A-2 may be considered as a minimum contribution rate that complies with the Board's funding policy. 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 System in excess of those presented in this report be considered.

The findings in this report are based on data and other information through June 30, 2018. 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

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 valuation was based upon information furnished by the Retirement Plan, concerning Retirement Plan benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the Retirement Plan.

In addition, this report was prepared using certain assumptions approved by the Board as described in the section of this report entitled Methods and Assumptions.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement plans. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the Arizona Corrections Officer Retirement Plan as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board, and with applicable statutes.

Mark Buis, James D. Anderson and Francois Pieterse are Members of the American Academy of Actuaries (MAAA). These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

| | | |
|---|---|---|
| Mark Buis | James D. Anderson | Francois Pieterse |
| FSA, EA, FCA, MAAA | FSA, EA, FCA, MAAA | ASA, FCA, MAAA |

MB/JDA/FP:rmn

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# Executive Summary/Board Summary

## 1. Required Employer Contributions to Support Retirement Benefits

The funded status as of June 30, 2018 and the computed employer contribution for the fiscal year beginning July 1, 2019 are shown below:

**Tier 1 & Tier 2 Members**:

| Averages | Pension | Health | Total |
|---|---|---|---|
| Employer Contribution Rate | 27.59% | 0.00% | 27.59% |
| Funded Status | 54.1% | 123.6% | 56.1% |

**Tier 3 members (hired on or after July 1, 2018) – pension only:**

- Employer Contribution for Tier 3 Defined Benefit benefits*: 4.95%
- Employer Contribution for Tier 1 and Tier 2 unfunded liability: 19.92%
- Total employer contribution as a percentage of Tier 3 payroll: 24.87%

* *Administrative Office of the Courts Probation and Surveillance only.*

## 2. Contribution Rate Comparison

The chart below compares the results for this valuation of the Retirement Plan with the results of the prior year's valuation:

**Tier 1 & Tier 2 Members**:

| Valuation Date | Pension | Health | Total |
|---|---|---|---|
| 6/30/2017 | 28.77% | 0.01% | 28.78% |
| 6/30/2018 | 27.59% | 0.00% | 27.59% |

Please note that the pension contribution rate shown above decreased from the June 30, 2017 valuation for most employers. The contribution rate decreased in the current valuation primarily due to the prior Permanent Benefit Increase (PBI) being replaced with a CPI-based Cost of Living Adjustment (COLA) for all retirees. In addition, benefit structure changes impact those hired on or after July 1, 2018 (Tier 3). This Tier has a different level of benefit promise, which is financed on a 1/3 – 2/3 basis between Employer/Employee. Existing unfunded accrued liabilities are financed over all employer payroll.

The reasons for the change in contribution rate and funded status are described in more detail on pages 2-4 of this report.

# Executive Summary/Board Summary

## 3. Reasons for Change

In aggregate, changes in the contribution rate and funded status are illustrated on the following charts. **The impact of each change will be different for each employer**.

| Contribution Rate | Pension | Health | Total |
|---|---|---|---|
| Contribution Rate Last Valuation | 28.77% | 0.01% | 28.78% |
| Asset Losses | 0.31% | 0.02% | 0.33% |
| Tier 2 | (0.27)% | (0.01)% | (0.28)% |
| Payroll Base | 1.18% | (0.03)% | 1.15% |
| PBI | (0.50)% | 0.00% | (0.50)% |
| Benefit Changes | (2.35)% | 0.00% | (2.35)% |
| Other | 0.45% | 0.01% | 0.46% |
| Contribution Rate This Valuation | 27.59% | 0.00% | 27.59% |

| Funded Status | Pension | Health | Total |
|---|---|---|---|
| Funded Status Last Valuation | 49.5% | 120.5% | 51.5% |
| Asset Losses | (0.3)% | (2.0)% | (0.4)% |
| Tier 2 | 0.0% | 0.0% | 0.0% |
| Payroll Base | 1.1% | 0.0% | 1.1% |
| PBI | 0.6% | 0.0% | 0.6% |
| Benefit Changes | 2.9% | 0.0% | 2.9% |
| Other | 0.3% | 5.1% | 0.4% |
| Funded Status This Valuation | 54.1% | 123.6% | 56.1% |

**Asset Losses –** Asset losses are based on 7-year smoothing of assets. The return on market value was 7.0% for the year ending June 30, 2018. However, based on funding value, the average return for the last 7 years is approximately 6.0%.

# Executive Summary/Board Summary

**Tier 2 –** The decrease in the contribution rate is due to the fact that as current members retire, they are replaced by new members who have a less costly Tier of Benefits (for members hired on or after January 1, 2012). This will typically result in a declining normal cost rate that will occur gradually over time as the population mix (Tier 1 / Tier 2) changes.

**Payroll Base –** Under the current amortization policy, the contribution rate is developed based on a percentage of payroll. To the extent that overall payroll is lower/greater than last year's payroll projected payroll growth, the contribution rate will increase/decrease as a result. For example, if there were 2 active members in the Plan last year and one of the members retired, the existing unfunded liability would now be spread over the payroll of one member instead of 2 members and the resulting contribution rate would be much higher. Therefore, it is important to consider the overall dollar level of the contribution along with the contribution rate. The dollar contributions are also shown on Page A-2. The change in the funded status is primarily due to gains or losses relative to the overall salary assumption, which includes both the wage base assumption and the merit and longevity components of the salary assumption. To the extent that payroll is lower/greater than last year's payroll projected payroll growth, the funded status rate will increase/decrease as a result.

**PBI Gain/(Loss) –** Under the current structure, retired members will receive a Permanent Benefit increase (PBI) under certain conditions based on the current year excess asset return. The valuation assumes a resulting average PBI of approximately 2.25% per year. Since there were no PBI for CORP members this year, this resulted in a gain for the Plan with a corresponding decrease in the contribution rate and increase in the funded status.

**Benefit Changes –** Changes to the benefit structure of CORP are summarized in section F of this report. Some of the key benefit changes follow:

- Replace the prior Permanent Benefit Increase with a CPI-based Cost of Living Adjustment (COLA) for all retirees.
- Pension reform changed the benefit formula for Tier 3 DB members (Probation & Surveillance Officers hired after June 30, 2018).
- Effective June 30, 2018, the plan is essentially closed to new hires. Other than Probation & Surveillance Officers, those hired on or after June 30, 2018 do not enter this plan, but instead enter a Defined Contribution Plan. A Statutory contribution is developed as a level percent of payroll for all employees of the employer (meaning members of this Retirement Plan and the Defined Contribution plan). In addition, this valuation develops a contribution in accordance with funding standards for a Closed pension plan, under which unfunded accrued liabilities are amortized on a level dollar basis, which increases the contribution rate in the short term.
- For newly hired Probation & Surveillance Officers during the year ending June 30, 2019, a 1/3-2/3 split of Tier 3 plan Normal cost between employees and employers applies.

**Other –** This is the combination of all factors other than those listed above and primarily reflects demographic gains and losses (i.e., retirement, turnover, disability, etc. experience that differs from the actuarial assumptions). While this number is small on a combined plan basis, it will vary considerably from employer to employer, especially for employers with a small number of members.

# Executive Summary/Board Summary

### 4. Plan Experience

Experience during the year ended June 30, 2018 was overall favorable. On a market value basis, the Plan's return for the year ended June 30, 2018 was 7.0%. However, the market value smoothing techniques used in this valuation of the System recognize both past and present investment gains and losses. The resulting actuarial asset yield for the year was 6.0%. The effects of the asset losses were more than offset by gains attributable to demographic experience. Detailed information related to Plan experience is shown on page B-2.

### 5. Looking Ahead

The continuing effect of prior asset losses was dampened by the 7-year smoothing period, and further offset by the effect of lower than expected pay increases. There remains $39.5 million of unrecognized investment losses that will, in the absence of other gains, put upward pressure on the contribution rate next year.

If the June 30, 2018 pension valuation results were based on market value instead of smoothed funding value, the pension funded percent of the plan would be 53.0% (instead of 54.1%), and the pension employer contribution requirement would be 28.12% of payroll (instead of 27.59%).

### 6. Conclusion

The changes in benefit structure decreased contribution rates for most employers, and along with favorable pay experience, served to increase the pension funded percent of the plan from 49% to 54%.

While the funded percent hovers around 50%, the recent experience study served to strengthen assumptions so that the Plan is on better footing. However, after accounting for active member contributions, the retired lives are less than fully funded on a funding value of assets basis, and much less than fully funded based upon the market value of assets (please see page B-4). It is most important that this Plan receive contributions at least equal to the rates shown in this report.

# SECTION A

## INTRODUCTION

# Funding Objective

The purpose of the annual actuarial valuation of the Arizona Corrections Officer Retirement Plan as of June 30, 2018 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 Section B.
- Compare accrued assets with accrued liabilities to assess the funded condition. This information is contained in Section B.
- Compute the employers' recommended contribution rates for the fiscal year beginning July 1, 2019. This information is contained in Section A.

This objective is stated in Article 4, Chapter 5, Title 38, Section 891A of the Arizona Revised Statutes.

# Contribution Rates

The Retirement System is supported by member contributions, employer contributions and investment income from Retirement System assets.

Contributions which satisfy the funding objective are determined by the annual actuarial valuation and are sufficient to:

(1) Cover the actuarial present value of benefits allocated to the current year by the actuarial cost method described in Section E (the normal cost); and

(2) Finance over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (the unfunded actuarial accrued liability).

***Computed contribution rates*** for the fiscal year beginning July 1, 2019 are shown on page A-2.

***Pension contribution dollars*** are also shown, based on the valuation payroll information adjusted to reflect annual payroll increases between the valuation date and the beginning of the fiscal year for which the contribution is being determined.

# Statutory Contribution Requirements

### Development of Employer Contributions for the Indicated Valuation Date

| Valuation Date | June 30, 2017 | | June 30, 2018 | |
|---|---|---|---|---|
| Contribution for Fiscal Year ending | 2019 | | 2020 | |
| **TIERS 1 & 2 MEMBERS** | | | | |
| **Pension** | **Rate** | **Dollar** | **Rate** | **Dollar** |
| **Normal Cost** | | | | |
| Service Pension | 11.90% | $ 79,033,031 | 11.88% | $ 73,569,277 |
| Disability Pension | 0.32% | 2,125,258 | 0.32% | 1,981,664 |
| Survivors of Active Members | 0.88% | 5,844,459 | 0.87% | 5,387,650 |
| Refund of Member Accumulated Contributions | 3.06% | 20,322,780 | 3.01% | 18,640,027 |
| **Total Normal Cost** | **16.16%** | **$ 107,325,528** | **16.08%** | **$ 99,578,618** |
| **Total Employee Cost*** | **(8.41%)** | **$ (55,854,437)** | **(8.41%)** | **$ (52,080,608)** |
| Employer Normal Cost | 7.75% | $ 51,471,092 | 7.67% | $ 47,498,010 |
| Employer Amortization of Unfunded Liabilities (Legacy) | 21.02% | 139,602,884 | 19.92% | 123,358,586 |
| **Total Employer Cost (Pension)** | **28.77%** | **$ 191,073,976** | **27.59%** | **$ 170,856,596** |

** Dispatcher members contribute 7.96% and non-dispatcher member contribute 8.41%.*

| Health | Rate | Dollar | Rate | Dollar |
|---|---|---|---|---|
| Total Normal Cost | 0.25% | $ 1,660,357 | 0.24% | $ 1,486,248 |
| Employer Amortization of Unfunded Liabilities (Legacy) | (0.24%) | (1,593,943) | (0.24%) | (1,486,248) |
| **Total Employer Cost (Health)** | **0.01%** | **$ 66,414** | **0.00%** | **$ -** |
| | | | | |
| **Tiers 1 & 2 Required Total Employer Cost (Pension + Health)** | **28.78%** | **$ 191,140,390** | **27.59%** | **$ 170,856,596** |

Actuarial accrued liability, $3,506,082,771, exceeded the funding value of assets, which was $1,897,961,275. The unfunded actuarial accrued liabilities were amortized as a level percent-of-payroll over a closed period of 18 years ending on June 30, 2037 and added to the employer normal cost. The 18-year period is a one year decrease from last year. The results shown above are prior to the application of the statutory minimum of 6% of payroll.

# Statutory Contribution Requirements

## Development of Employer Contributions for the Indicated Valuation Date

| Valuation Date | June 30, 2017 | June 30, 2018 |
|---|---|---|
| Contribution for Fiscal Year ending | 2019 | 2020 |
| **TIER 3 MEMBERS - DEFINED BENEFIT (DB) PLAN - (AOC Probation and Surveillance Only)** | | |
| **Pension** | **Rate** | **Rate** |
| Total Normal Cost | 14.85% | 14.85% |
| Amortization of Unfunded Liabilities | 0.00% | 0.00% |
| **Total Pension Cost** | **14.85%** | **14.85%** |
| Employee (EE) Pension Cost | 9.90% | 9.90% |
| Employer (ER) Pension Cost | 4.95% | 4.95% |
| **Health** | **Rate** | **Rate** |
| Total Normal Cost | 0.42% | 0.42% |
| Amortization of Unfunded Liabilities | 0.00% | 0.00% |
| **Total Health Cost** | **0.42%** | **0.42%** |
| Employee (EE) Health Cost | 0.28% | 0.28% |
| Employer (ER) Health Cost | 0.14% | 0.14% |
| **Total Calculated Tier 3 Required EE Individual Cost (before Legacy)** | **10.18%** | **10.18%** |
| **Total Calculated Tier 3 Required ER Individual Cost (before Legacy)** | **5.09%** | **5.09%** |
| **ER Legacy Cost of Tier 1 & 2 Amort of Unfunded Liabilities*** | 21.02% | 19.92% |
| **Total Calculated Tier 3 Required Employer Defined Benefit Cost** | **26.11%** | **25.01%** |

*Note: Due to Tier 3 beginning July 1, 2018, equivalent dollar amounts are not available until actual payroll data is experienced in order to provide accurate projections.*

| Defined Contribution (DC) Retirement Plan | Rate | Rate |
|---|---|---|
| Tier 3 DC Only - Employee** | 7.00% | 7.00% |
| Tier 3 DC Only - Employee Disability Program*** | 0.70% | 0.70% |
| **Tier 3 DC Only - Total Employee** | **7.70%** | **7.70%** |
| Tier 3 DC Only - Employer** | 5.00% | 5.00% |
| Tier 3 DC Only - Employer Disability Program*** | 0.70% | 0.70% |
| **Tier 3 DC Only - Total Employer (before Legacy)** | **5.70%** | **5.70%** |
| Tier 3 DC Only - Employer Tier 1 & 2 Legacy Cost* | 21.02% | 19.92% |
| Tier 3 DC Only - Total Employer Cost | **26.72%** | **25.62%** |

** Pursuant to A.R.S. 38-891, subsection A, the amortization of unfunded liabilities for Tiers 1 & 2 shall be applied to all Tier 3 payroll on a level percent basis. However, while it is statutorily required to present the rates in this manner, these are the minimums where alternate methods for paying down that unfunded liability is at the discretion of each employer. Further, to understand the effects of reform in relation to Tier 3, compare the total rate of Tier 3 before application of those legacy costs.*

*** While the default contribution rate is 7%, members can elect a rate as low as 5% when they are first hired. Paid directly to third-party administrator, currently Nationwide.*

**** Paid directly to PSPRS along with the legacy cost.*

## Historical Summary of Employer Pension Rates

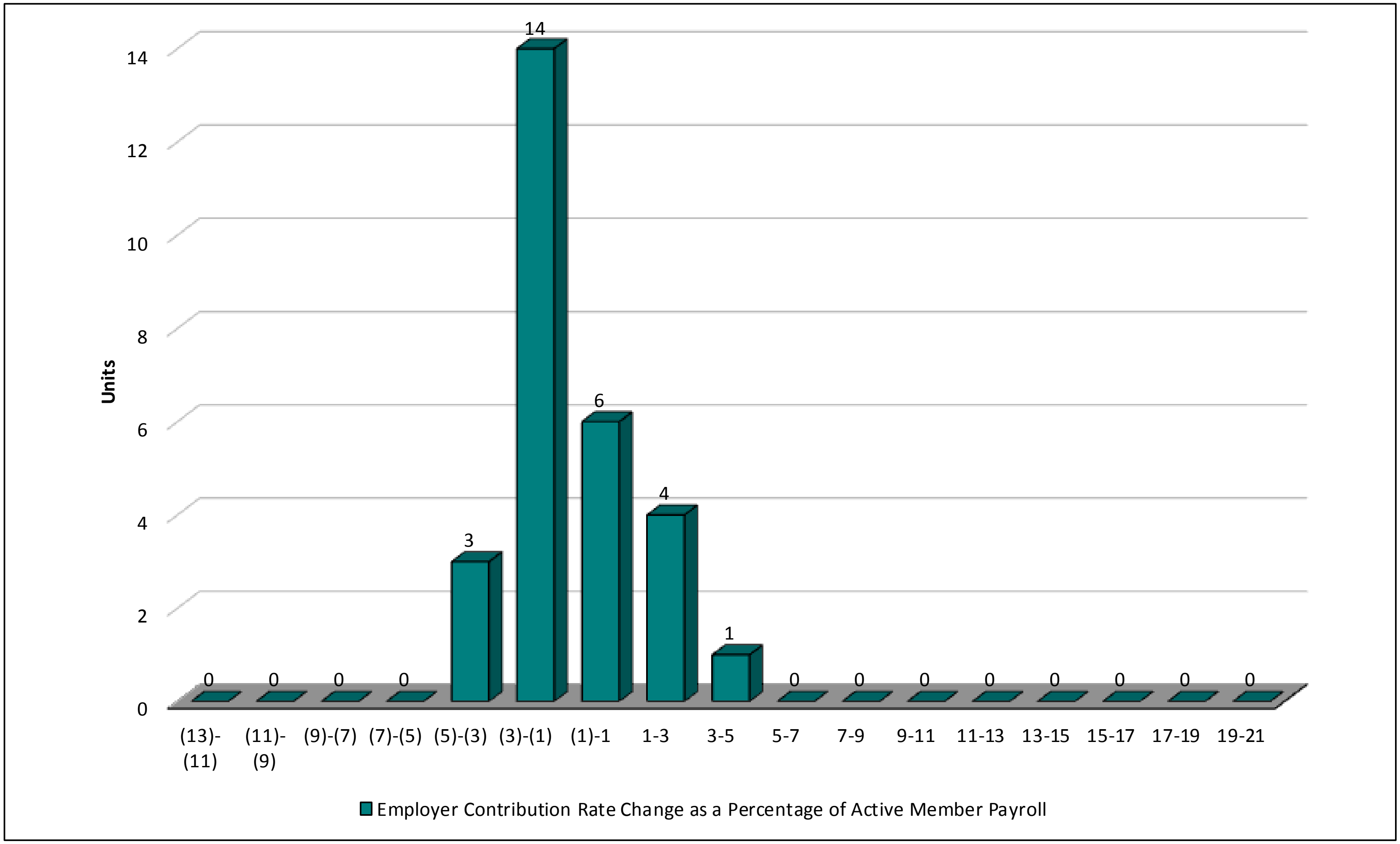
| Valuation Date June 30 | Fiscal Year Ending June 30 | Normal Cost | Unfunded Actuarial Accrued Liability | Total |
|---|---|---|---|---|
| 2009 | 2011 | 6.43% | 2.14% | 8.57% |
| 2010 | 2012 | 6.67 | 2.83 | 9.50 |
| 2011 | 2013 | 6.47 | 4.84 | 11.31 |
| 2012 | 2014 | 7.50 | 6.18 | 13.68 |
| 2013 | 2015 | 7.12 | 7.34 | 14.46 |
| 2014* (before phase-in) | 2016 | 6.55 | 11.44 | 17.99 |
| 2014* (after phase-in) | 2016 | 6.55 | 8.27 | 14.82 |
| 2015 (before phase-in) | 2017 | 6.40 | 12.11 | 18.51 |
| 2015 (after phase-in) | 2017 | 6.40 | 10.35 | 16.75 |
| 2016 | 2018 | 7.11 | 13.65 | 20.76 |
| 2017 | 2019 | 7.75 | 21.02 | 28.77 |
| **2018** | **2020** | **7.67** | **19.92** | **27.59** |

** Beginning with the June 30, 2014 valuation the rates are for pension only.*

## Historical Summary of Employer Health Rates

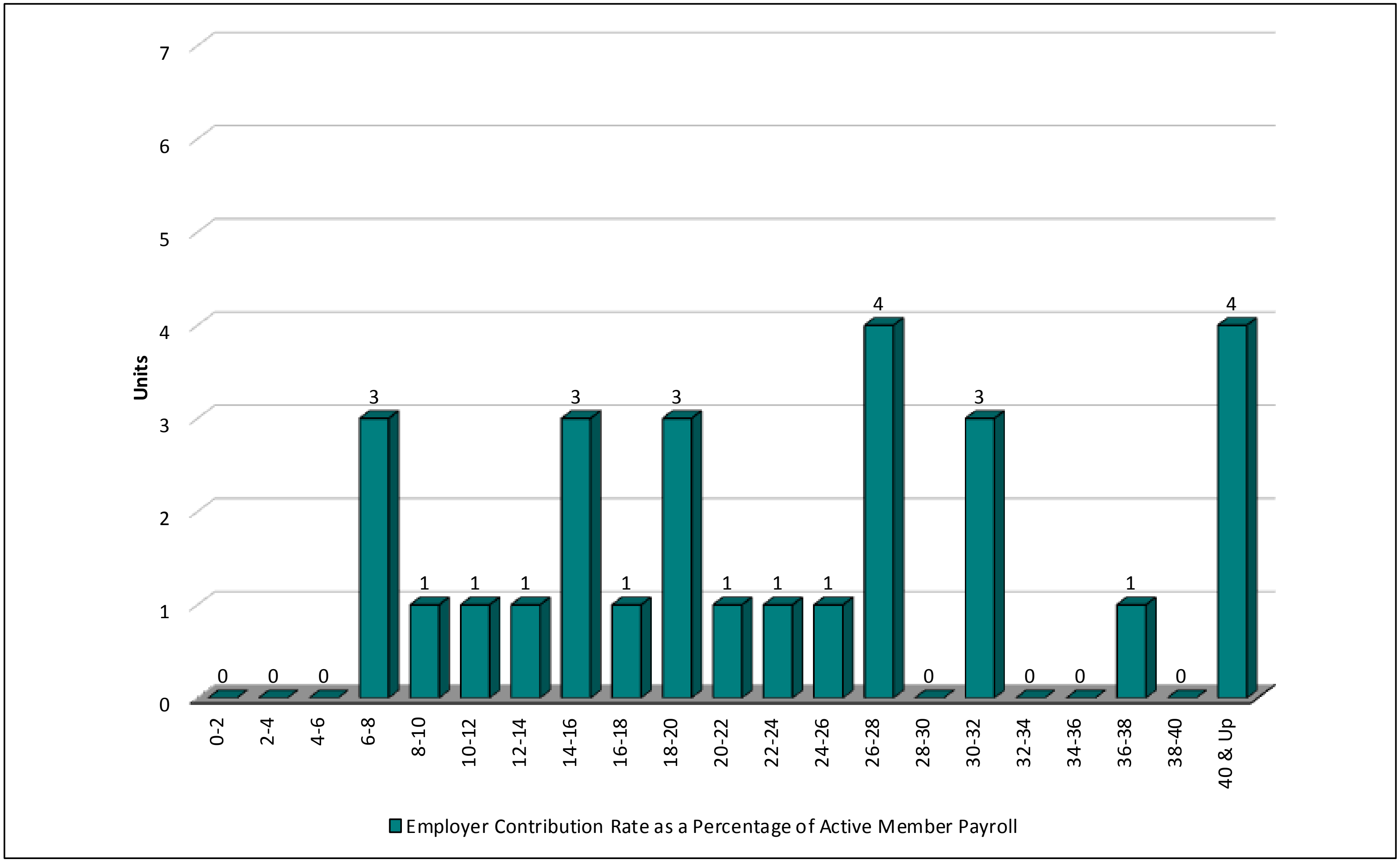
| Valuation Date June 30 | Fiscal Year Ending June 30 | Normal Cost | Unfunded Actuarial Accrued Liability | Total |
|---|---|---|---|---|
| 2014 | 2016 | 0.33% | (0.11)% | 0.22% |
| 2015 | 2017 | 0.31 | (0.11) | 0.20 |
| 2016 | 2018 | 0.32 | (0.10) | 0.22 |
| 2017 | 2019 | 0.25 | (0.24) | 0.01 |
| **2018** | **2020** | **0.24** | **(0.24)** | **0.00** |

# Employer Contribution Rate Changes at June 30, 2018
# All Employers*




** Employer contribution rate changes from the fiscal year ending June 30, 2019 to the fiscal year ending June 30, 2020.*

# Employer Contribution Rates - All Employers at June 30, 2018




** Employer pension contribution rates applicable for the fiscal year ending June 30, 2020.*

# SECTION B

## FUNDING RESULTS

# Present Value of Future Benefits and Accrued Liability

| | June 30, 2017 | June 30, 2018 |
|---|---|---|
| **Pension** | | |
| A. Accrued Liability | | |
| 1. For retirees and beneficiaries | $ 1,845,299,461 | $ 1,824,876,153 |
| 2. For vested terminated members | 34,795,718 | 29,975,039 |
| 3. For present active members | | |
| a. Value of expected future benefit payments | 2,387,307,316 | 2,295,493,902 |
| b. Value of future normal costs | 643,022,613 | 644,262,323 |
| c. Active member accrued liability: (a) - (b) | 1,744,284,703 | 1,651,231,579 |
| 4. Total accrued liability | 3,624,379,882 | 3,506,082,771 |
| B. Present Assets (Funding Value) | 1,795,711,132 | 1,896,970,783 |
| C. Unfunded Accrued Liability: (A.4) - (B) | 1,828,668,750 | 1,609,111,988 |
| D. Stabilization Reserve | 17,446 | 281,949 |
| E. Net Unfunded Accrued Liability: (C) + (D) | $ 1,828,686,196 | $ 1,609,393,937 |
| F. Funding Ratio: (B) / (A.4) | 49.5% | 54.1% |
| **Health** | | |
| A. Accrued Liability | | |
| 1. For retirees and beneficiaries | $ 47,179,909 | $ 48,665,084 |
| 2. For present active members | | |
| a. Value of expected future benefit payments | 62,566,013 | 62,574,158 |
| b. Value of future normal costs | 9,251,414 | 9,097,571 |
| c. Active member accrued liability: (a) - (b) | 53,314,599 | 53,476,587 |
| 3. Total accrued liability | 100,494,508 | 102,141,671 |
| B. Present Assets (Funding Value) | 121,134,026 | 126,229,888 |
| C. Net Unfunded Accrued Liability: (A.3) - (B) | $ (20,639,518) | $ (24,088,217) |
| D. Funding Ratio: (B) / (A.3) | 120.5% | 123.6% |

# Derivation of Experience Gain/(Loss)

Actual experience will never (except by coincidence) exactly match assumed experience. Gains and losses often 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 a year-by-year comparative schedule.

| | June 30, 2017 | June 30, 2018 |
|---|---|---|
| (1) UAAL* at start of year | $ 1,252,403,249 | $ 1,828,668,750 |
| (2) Normal cost from last valuation | 97,866,822 | 101,983,469 |
| (3) Actual contributions | 168,207,111 | 177,109,214 |
| (4) Interest accrual | 91,292,483 | 132,541,835 |
| (5) Expected UAAL before changes: (1) + (2) - (3) + (4) | 1,273,355,443 | 1,886,084,840 |
| (6) Changes from benefit increases, methods and assumptions | 557,836,731 | (202,511,784) |
| (7) Change in reserve for future pension increases | - | - |
| (8) Expected UAAL after changes: (5) + (6) + (7) | 1,831,192,174 | 1,683,573,056 |
| (9) Actual UAAL at end of year | 1,828,668,750 | 1,609,111,988 |
| (10) Experience Gain/(Loss): (8) -(9) | $ 2,523,424 | $ 74,461,068 |

* *Unfunded Actuarial Accrued Liability.*

**FY 2018 Gains and Losses by Source**

| | Gain/(Loss) | % of Liability |
|---|---|---|
| Investment Return | $ (24,750,433) | (0.7%) |
| Salary Increases | 76,504,292 | 2.1% |
| Retirement | 2,118,750 | 0.1% |
| Turnover | (15,622,473) | (0.4%) |
| Disability | 294,126 | 0.0% |
| Death-in-Service | (1,549,871) | 0.0% |
| PBI | 39,849,633 | 1.1% |
| Retiree Mortality | (3,426,923) | (0.1%) |
| Other | 1,043,967 | 0.0% |
| Total | $ 74,461,068 | 2.1% |

# Unfunded Actuarial Accrued Liabilities
# Comparative Statement

(Dollar amounts in $'000s)

**Pension**

| Valuation Date | (1) Actuarial Accrued Liabilities (AAL) | (2) Valuation Assets | (3) Unfunded AAL | (4) Funded Ratio (2)/(1) | (5) Financing Period | (6) Payroll | Liability Ratio (7) Unfunded (3)/(6) | Liability Ratio (8) Total (1)/(6) |
|---|---|---|---|---|---|---|---|---|
| 2009 | $ 1,584,293 | $ 1,309,124 | $ 275,169 | 82.6% | 27 yrs. | $ 630,825 | 43.6% | 251.1% |
| 2010 | 1,722,006 | 1,382,144 | 339,862 | 80.3 | 26 | 616,481 | 55.1 | 279.3 |
| 2011 | 2,008,569 | 1,466,750 | 541,819 | 73.0 | 25 | 609,243 | 88.9 | 329.7 |
| 2012 | 2,231,544 | 1,512,989 | 718,555 | 67.8 | 24 | 626,223 | 114.7 | 356.3 |
| 2013 | 2,330,238 | 1,559,583 | 770,655 | 66.9 | 23 | 604,068 | 127.6 | 385.8 |
| 2014 * | 2,637,545 | 1,511,212 | 1,126,333 | 57.3 | 22 | 625,264 | 180.1 | 421.8 |
| 2015 | 2,740,236 | 1,571,431 | 1,168,805 | 57.3 | 21 | 616,267 | 189.7 | 444.7 |
| 2016 | 2,930,678 | 1,678,275 | 1,252,403 | 57.3 | 20 | 599,319 | 209.0 | 489.0 |
| 2017 | 3,624,380 | 1,795,711 | 1,828,669 | 49.5 | 19 | 619,985 | 295.0 | 584.6 |
| **2018** | **3,506,083** | **1,896,971** | **1,609,112** | **54.1** | **18** | **619,270** | **259.8** | **566.2** |

** Pension only beginning with the June 30, 2014 valuation.*

**Health**

| Valuation Date | (1) Actuarial Accrued Liabilities (AAL) | (2) Valuation Assets | (3) Unfunded AAL | (4) Funded Ratio (2)/(1) | (5) Financing Period | (6) Payroll | Liability Ratio (7) Unfunded (3)/(6) | Liability Ratio (8) Total (1)/(6) |
|---|---|---|---|---|---|---|---|---|
| 2014 | $ 97,015 | $ 102,100 | $ (5,085) | 105.2% | 22 yrs. | $ 625,264 | (0.8)% | 15.5% |
| 2015 | 100,871 | 111,346 | (10,475) | 110.4 | 21 | 616,267 | (1.7) | 16.4 |
| 2016 | 107,001 | 116,150 | (9,149) | 108.6 | 20 | 599,319 | (1.5) | 17.9 |
| 2017 | 100,495 | 121,134 | (20,639) | 120.5 | 19 | 619,985 | (3.3) | 16.2 |
| **2018** | **102,142** | **126,230** | **(24,088)** | **123.6** | **18** | **619,270** | **(3.9)** | 16.5 |

The Unfunded Liability ratio gives a general measure of the ability to collect contributions to pay off the unfunded liabilities. The Total Liability ratio gives a longer term indication of the volatility of the contribution rate.

# Short Condition Test

If the contributions to CORP are soundly executed, the System will ***pay all promised benefits when due -- the ultimate test of financial soundness***.

***A short condition test*** is one means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with:

1) Member contributions on deposit;
2) The liabilities for future benefits to present retired lives; and
3) The liabilities for service already rendered by active and inactive members.

In a plan that has been following the discipline of pre-funding, the liabilities for member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active and inactive members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the plan.

## Short Condition Test

*(in $'000s)*

**Pension**

| Calendar Year | Aggregate Actuarial Liabilities for (1) Non-Retired Contributions | (2) Annuitants | (3) Non-Retired Members (Employer Financed Portion) | Actuarial Assets | Portion of Actuarial Liabilities Covered by Assets (1) | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2009 | $314,100 | $ 586,596 | $ 683,597 | $1,309,124 | 100% | 100% | 59.7% |
| 2010 | 345,122 | 689,910 | 686,973 | 1,382,144 | 100% | 100% | 50.5% |
| 2011 | 353,892 | 823,664 | 831,013 | 1,466,750 | 100% | 100% | 34.8% |
| 2012 | 373,726 | 918,771 | 939,047 | 1,512,989 | 100% | 100% | 23.5% |
| 2013 | 382,417 | 1,011,478 | 936,343 | 1,559,583 | 100% | 100% | 17.7% |
| 2014* | 396,381 | 1,269,515 | 971,649 | 1,511,212 | 100% | 88% | 0.0% |
| 2015 | 406,641 | 1,351,259 | 982,336 | 1,571,431 | 100% | 86% | 0.0% |
| 2016 | 408,016 | 1,495,287 | 1,027,375 | 1,678,275 | 100% | 85% | 0.0% |
| 2017 | 417,714 | 1,845,299 | 1,361,367 | 1,795,711 | 100% | 75% | 0.0% |
| **2018** | **423,519** | **1,824,876** | **1,257,688** | **1,896,971** | **100%** | **81%** | **0.0%** |

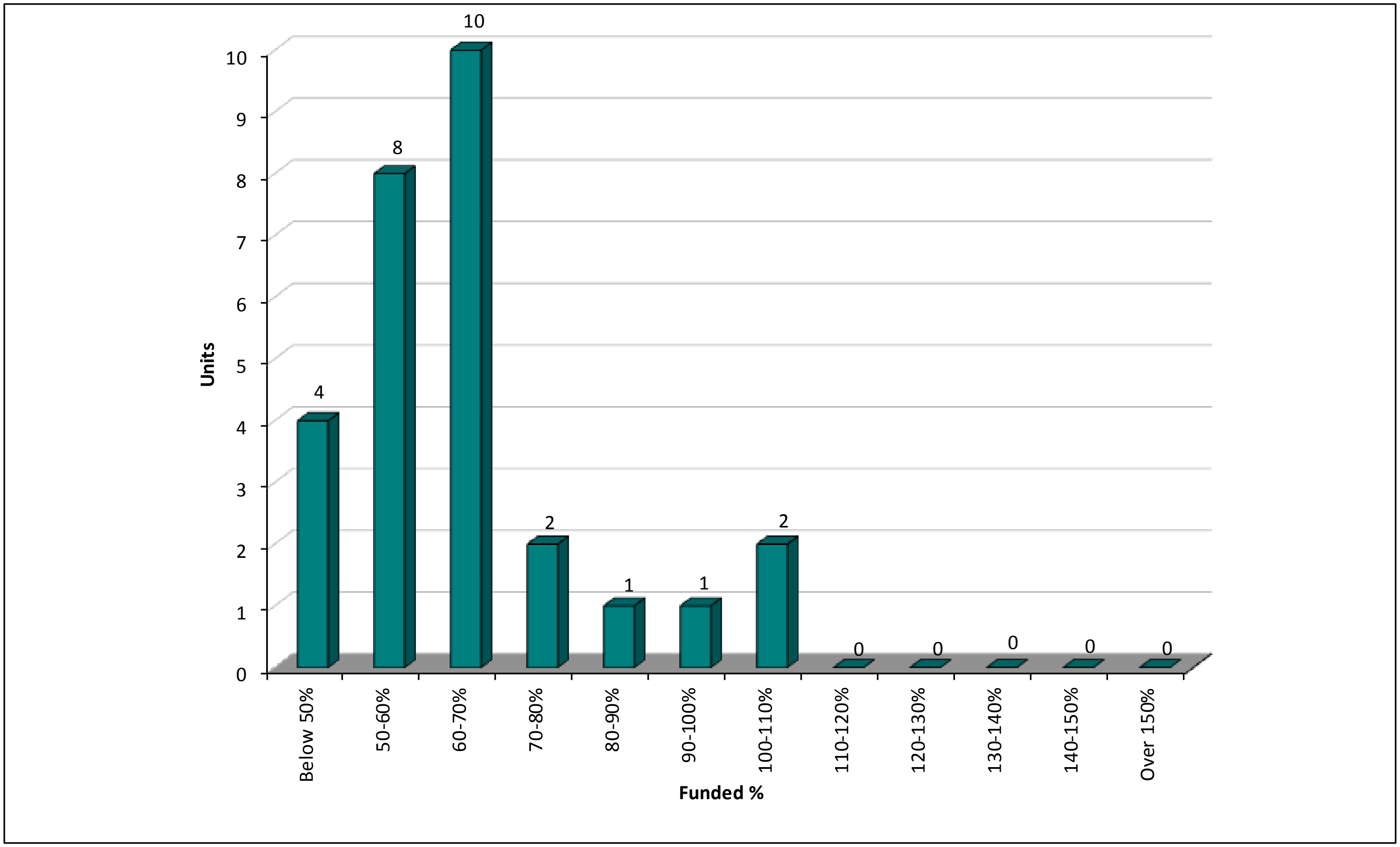
** Pension only beginning with the June 30, 2014 valuation.*

# Short Condition Test

**Health**

| Calendar Year | Aggregate Actuarial Liabilities for (1) Non-Retired Contributions | (2) Annuitants | (3) Non-Retired Members (Employer Financed Portion) | Actuarial Assets | Portion of Actuarial Liabilities Covered by Assets (1) | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2014 | $ 0 | $32,793 | $64,222 | $102,100 | 100% | 100% | 107.9% |
| 2015 | 0 | 36,787 | 64,084 | 111,346 | 100% | 100% | 116.3% |
| 2016 | 0 | 41,492 | 65,509 | 116,150 | 100% | 100% | 114.0% |
| 2017 | 0 | 47,180 | 53,315 | 121,134 | 100% | 100% | 138.7% |
| **2018** | **0** | **48,665** | **53,477** | **126,230** | **100%** | **100%** | **145.0%** |

# Funded Percents - All Employers at June 30, 2018




** Employer pension funded percents at June 30, 2018.*

# Pension Contribution Projection

| Fiscal Year Ending June 30 | Contribution Rate | Contribution Amount (Estimate) |
|---|---|---|
| 2020 | 27.59% | $170,856,596 |
| 2021 | 27.37 | 175,426,499 |
| 2022 | 27.20 | 180,438,685 |
| 2023 | 27.17 | 186,548,060 |
| 2024 | 27.01 | 191,940,240 |
| 2025 | 26.63 | 195,863,254 |
| 2026 | 26.36 | 200,663,117 |
| 2027 | 26.06 | 205,322,673 |
| 2028 | 25.74 | 209,899,493 |
| 2029 | 25.39 | 214,291,970 |
| 2030 | 25.04 | 218,734,794 |

Contribution Rate and Amount estimated based on June 30, 2018 valuation data, methods, and assumptions, including 7.40% investment return and 3.5% payroll growth.

The contribution rates shown above should be applied to the payroll of Defined Benefit and Defined Contribution Plan members.

# SECTION C

## FUND ASSETS

# Development of Pension Funding Value of Assets (7-Year Smoothing)

| Year Ended June 30: | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|
| A. Funding Value Beginning of Year | $ 1,795,711,132 | | | | | | |
| B. Market Value End of Year | 1,857,422,954 | | | | | | |
| C. Market Value Beginning of Year | 1,741,995,663 | | | | | | |
| D. Non Investment Net Cash Flow | (6,627,329) | | | | | | |
| E. Investment Income | | | | | | | |
| E1. Total: B-C-D | 122,054,620 | | | | | | |
| E2. Amount for Immediate Recognition: (7.40%) | 132,637,413 | | | | | | |
| E3. Amount for Phased-in Recognition: E1-E2 | (10,582,793) | | | | | | |
| F. Phased-in Recognition of Investment Income | | | | | | | |
| F1. Current Year: E3 / 7 | (1,511,828) | | | | | | |
| F2. First Prior Year | 8,429,734 | $ (1,511,828) | | | | | |
| F3. Second Prior Year | (16,290,498) | 8,429,734 | $ (1,511,828) | | | | |
| F4. Third Prior Year | (9,194,258) | (16,290,498) | 8,429,734 | $ (1,511,828) | | | |
| F5. Fourth Prior Year | 8,714,006 | (9,194,258) | (16,290,498) | 8,429,734 | $ (1,511,828) | | |
| F6. Fifth Prior Year | 2,691,222 | 8,714,006 | (9,194,258) | (16,290,498) | 8,429,734 | $ (1,511,828) | |
| F7. Sixth Prior Year | (17,588,811) | 2,691,224 | 8,714,004 | (9,194,260) | (16,290,497) | 8,429,733 | $ (1,511,825) |
| F8. Total Recognized Investment Gain | (24,750,433) | (7,161,620) | (9,852,846) | (18,566,852) | (9,372,591) | 6,917,905 | (1,511,825) |
| G. Funding Value End of Year | | | | | | | |
| G1. Preliminary Funding Value End of Year: (A+D+E2+F1:F7) | 1,896,970,783 | | | | | | |
| G2. Upper Corridor: (120% x B) | 2,228,907,545 | | | | | | |
| G3. Lower Corridor: (80% x B) | 1,485,938,363 | | | | | | |
| G4. End of Year: (G1 subject to max of G2 and min of G3) | 1,896,970,783 | | | | | | |
| H. Difference Between Market Value & Funding Value: (B-G4) | (39,547,829) | (32,386,209) | (22,533,363) | (3,966,511) | 5,406,080 | (1,511,825) | 0 |
| I. Market Rate of Return | 7.0% | | | | | | |
| J. Recognized Rate of Return | 6.0% | | | | | | |
| K. Ratio of Funding Value to Market Value | 102.1% | | | | | | |

The funding value of assets recognizes assumed investment return (line E2) fully each year. Differences between actual and assumed investment return (line E3) are phased-in over a closed 7-year period. During periods when investment performance exceeds the assumed rate, funding value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, funding value of assets will tend to be greater than market value. The funding value of assets is **unbiased** with respect to market value. At any time it may be either greater or less than market value. If actual and assumed rates of investment return are exactly equal for 7 consecutive years, the funding value will become equal to market value.

# Development of Health Funding Value of Assets (7-Year Smoothing)

| Year Ended June 30: | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|
| A. Funding Value Beginning of Year | $ 121,134,026 | | | | | | |
| B. Market Value End of Year | 123,525,328 | | | | | | |
| C. Market Value Beginning of Year | 117,351,146 | | | | | | |
| D. Non Investment Net Cash Flow | (2,139,760) | | | | | | |
| E. Investment Income | | | | | | | |
| E1. Total: B-C-D | 8,313,942 | | | | | | |
| E2. Amount for Immediate Recognition: (7.40%) | 8,884,747 | | | | | | |
| E3. Amount for Phased-in Recognition: E1-E2 | (570,805) | | | | | | |
| F. Phased-in Recognition of Investment Income | | | | | | | |
| F1. Current Year: E3 / 7 | (81,544) | | | | | | |
| F2. First Prior Year | 574,691 | $ (81,544) | | | | | |
| F3. Second Prior Year | (1,140,445) | 574,691 | $ (81,544) | | | | |
| F4. Third Prior Year | (623,076) | (1,140,445) | 574,691 | $ (81,544) | | | |
| F5. Fourth Prior Year | 584,150 | (623,076) | (1,140,445) | 574,691 | $ (81,544) | | |
| F6. Fifth Prior Year | 173,946 | 584,150 | (623,076) | (1,140,445) | 574,691 | $ (81,544) | |
| F7. Sixth Prior Year | (1,136,847) | 173,947 | 584,154 | (623,078) | (1,140,442) | 574,693 | $ (81,541) |
| F8. Total Recognized Investment Gain | (1,649,125) | (512,277) | (686,220) | (1,270,376) | (647,295) | 493,149 | (81,541) |
| G. Funding Value End of Year | | | | | | | |
| G1. Preliminary Funding Value End of Year: (A+D+E2+F1:F7) | 126,229,888 | | | | | | |
| G2. Upper Corridor: (120% x B) | 148,230,394 | | | | | | |
| G3. Lower Corridor: (80% x B) | 98,820,262 | | | | | | |
| G4. End of Year: (G1 subject to max of G2 and min of G3) | 126,229,888 | | | | | | |
| H. Difference Between Market Value & Funding Value: (B-G4) | (2,704,560) | (2,192,283) | (1,506,063) | (235,687) | 411,608 | (81,541) | 0 |
| I. Market Rate of Return | 7.1% | | | | | | |
| J. Recognized Rate of Return | 6.0% | | | | | | |
| K. Ratio of Funding Value to Market Value | 102.2% | | | | | | |

The funding value of assets recognizes assumed investment return (line E2) fully each year. Differences between actual and assumed investment return (line E3) are phased-in over a closed 7-year period. During periods when investment performance exceeds the assumed rate, funding value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, funding value of assets will tend to be greater than market value. The funding value of assets is **unbiased** with respect to market value. At any time it may be either greater or less than market value. If actual and assumed rates of investment return are exactly equal for 7 consecutive years, the funding value will become equal to market value.

# Revenues and Disbursements

## Pension

| | 2017 | 2018 |
|---|---|---|
| **Market Value at the Beginning of Year:** | $1,552,273,458 | $1,741,995,663 |
| **Revenues:** | | |
| a. Member contributions | $ 52,987,140 | $ 51,860,757 |
| b. Employer contributions | 115,134,684 | 125,582,081 |
| c. Investment income (net of expenses) | 185,053,827 | 122,054,620 |
| d. Net transfers | 85,287 | (333,623) |
| e. Total | $ 353,260,938 | $ 299,163,835 |
| **Disbursements:** | | |
| a. Refunds of member contributions | $ 27,732,946 | $ 27,940,636 |
| b. Pension benefits (including DROP) | 134,160,592 | 153,886,473 |
| c. Administrative Expenses | 1,645,195 | 1,909,435 |
| d. Totals | $ 163,538,733 | $ 183,736,544 |
| **Reserve Increase:** | | |
| Total revenues minus total disbursements | $ 189,722,205 | $ 115,427,291 |
| **Market Value at the End of Year:** | $1,741,995,663 | $1,857,422,954 |

## Health

| | 2017 | 2018 |
|---|---|---|
| **Market Value at the Beginning of Year:** | $ 107,420,586 | $ 117,351,146 |
| **Revenues:** | | |
| a. Health contributions | 1,395,772 | 2,148,405 |
| b. Interest income (net of expenses) | 12,632,763 | 8,313,941 |
| c. Total | $ 14,028,535 | $ 10,462,346 |
| **Disbursements:** | $ 4,097,975 | $ 4,288,164 |
| **Reserve Increase:** | | |
| Total revenues minus total disbursements | $ 9,930,560 | $ 6,174,182 |
| **Market Value at the End of Year:** | $ 117,351,146 | $ 123,525,328 |

# SECTION D

## CENSUS DATA

# June 30, 2018 Valuation Data Summary

For purposes of the June 30, 2018 valuation, information on 22,731 covered persons was furnished. These people may be briefly described as follows:

| | | Averages | | | |
|---|---|---|---|---|---|
| | | | | Annual Pay or Retirement Allowance | |
| | No. | Age | Years of Service | 2018 | 2017 |
| Actives | 14,335 | 38.7 | 8.2 | $43,200 | $44,418 |
| Retirees & Beneficiaries | 5,395 | 64.4 | | 27,484 | 27,423 |
| Inactive/Vested | 3,001 | 38.0 | | | |
| | 22,731 | | | | |

# Active Members

**Members in Active Service as of June 30, 2018**
**by Years of Service**

| Age | Years of Service 0 - 4 | 5 - 9 | 10 - 14 | 15 - 19 | 20 - 24 | 25 - 29 | 30 & Up | Total Count | Total Pay | Average Pay |
|---|---|---|---|---|---|---|---|---|---|---|
| Under 25 | 1,341 | 2 | | | | | | 1,343 | $ 45,132,859 | $33,606 |
| 25 - 29 | 2,243 | 413 | 8 | | | | | 2,664 | 98,814,369 | 37,092 |
| 30 - 34 | 1,090 | 822 | 312 | 2 | | | | 2,226 | 90,154,722 | 40,501 |
| 35 - 39 | 546 | 468 | 672 | 152 | 2 | | | 1,840 | 81,766,575 | 44,438 |
| 40 - 44 | 373 | 309 | 483 | 505 | 70 | | | 1,740 | 82,891,375 | 47,639 |
| 45 - 49 | 277 | 328 | 406 | 432 | 184 | 21 | | 1,648 | 79,824,392 | 48,437 |
| 50 - 54 | 180 | 208 | 284 | 298 | 135 | 80 | 4 | 1,189 | 58,588,470 | 49,275 |
| 55 - 59 | 145 | 134 | 239 | 225 | 90 | 55 | 32 | 920 | 44,744,793 | 48,636 |
| 60 - 64 | 64 | 101 | 130 | 170 | 62 | 35 | 20 | 582 | 28,416,247 | 48,825 |
| 65 and over | 18 | 38 | 54 | 36 | 19 | 9 | 9 | 183 | 8,936,209 | 48,832 |
| Total | 6,277 | 2,823 | 2,588 | 1,820 | 562 | 200 | 65 | 14,335 | $ 619,270,011 | $43,200 |

# Inactive/Vested Members

| Age | Years of Service 0 - 4 | 5 - 9 | 10 - 14 | 15 - 19 | 20 & Up | Total Count |
|---|---|---|---|---|---|---|
| Under 30 | 906 | 15 | | | | 921 |
| 30 - 39 | 870 | 111 | 27 | 3 | | 1,011 |
| 40 - 44 | 225 | 44 | 16 | 2 | | 287 |
| 45 - 49 | 188 | 32 | 18 | 8 | | 246 |
| 50 - 54 | 143 | 20 | 19 | 7 | | 189 |
| 55 - 59 | 106 | 21 | 32 | 7 | 1 | 167 |
| 60 - 69 | 100 | 18 | 33 | 10 | | 161 |
| 70 and over | 15 | 1 | 2 | | 1 | 19 |
| Total | 2,553 | 262 | 147 | 37 | 2 | 3,001 |

# Retirees and Beneficiaries

| Attained Ages | Males No. | Males Annual Pension Benefits | Females No. | Females Annual Pension Benefits | Total No. | Total Annual Pension Benefits |
|---|---|---|---|---|---|---|
| Under 25 | 5 | $ 59,637 | 5 | $ 65,683 | 10 | $ 125,320 |
| 25-29 | 0 | 0 | 6 | 83,903 | 6 | 83,903 |
| 30-34 | 1 | 20,713 | 5 | 82,215 | 6 | 102,928 |
| 35-39 | 8 | 168,373 | 15 | 239,214 | 23 | 407,587 |
| 40-44 | 63 | 1,669,761 | 36 | 816,263 | 99 | 2,486,024 |
| 45-49 | 269 | 7,374,640 | 118 | 3,148,728 | 387 | 10,523,368 |
| 50-54 | 404 | 11,748,212 | 178 | 5,370,599 | 582 | 17,118,811 |
| 55-59 | 490 | 15,382,813 | 268 | 8,310,882 | 758 | 23,693,695 |
| 60-64 | 540 | 17,066,477 | 310 | 9,292,529 | 850 | 26,359,006 |
| 65-69 | 657 | 19,172,078 | 354 | 9,096,916 | 1,011 | 28,268,994 |
| 70-74 | 511 | 14,646,810 | 279 | 6,733,892 | 790 | 21,380,702 |
| 75-79 | 300 | 6,898,300 | 185 | 3,605,062 | 485 | 10,503,362 |
| 80-84 | 159 | 3,194,650 | 102 | 1,874,999 | 261 | 5,069,649 |
| 85-89 | 64 | 1,214,859 | 41 | 646,908 | 105 | 1,861,767 |
| 90-94 | 10 | 137,442 | 8 | 100,877 | 18 | 238,319 |
| 95-99 | 3 | 41,750 | 1 | 9,775 | 4 | 51,525 |
| 100 and Over | 0 | 0 | 0 | 0 | 0 | 0 |
| **Totals** | **3,484** | **$98,796,515** | **1,911** | **$49,478,445** | **5,395** | **$148,274,960** |

| **Pension Being Paid** | | **Number** | **Annual Pensions** | **Average Pensions** |
|---|---|---|---|---|
| Retired Members | Service Pensions | 4,588 | $132,945,707 | $28,977 |
| | Disability Pensions | 140 | 2,957,371 | 21,124 |
| Totals | | 4,728 | 135,903,078 | 28,744 |
| Survivors of Members | Spouses | 632 | 11,897,250 | 18,825 |
| | Children with Guardians | 35 | 474,632 | 13,561 |
| Total | | 667 | 12,371,882 | 18,549 |
| **Total Pension Being Paid** | | **5,395** | **$148,274,960** | **$27,484** |

| | **Average Age** | **Average Service** | **Average Age at Retirement** |
|---|---|---|---|
| Normal Retired Members | 64.2 | 20.2 | 56.2 |
| Disability Retired Members | 58.3 | 9.7 | 46.0 |
| Spouse Beneficiaries | 68.5 | 13.4 | 52.5 |

# Pensions Being Paid
# Historical Schedule

| Valuation Date June 30 | No. | Annual Pensions | % Incr. in Annual Pensions | Average Pension | Present Value of Pensions Total | Present Value of Pensions Average |
|---|---|---|---|---|---|---|
| 1990 | 115 | $ 765,738 | 34.0% | $ 6,659 | $ 7,150,080 | $ 62,175 |
| 1995 | 435 | 3,456,705 | 27.5 | 7,946 | 34,140,660 | 78,484 |
| 2000 | 925 | 11,042,151 | 14.5 | 11,937 | 107,650,253 | 116,379 |
| 2001 | 1,040 | 13,446,069 | 21.8 | 12,929 | 124,247,094 | 119,468 |
| 2002 | 1,218 | 17,660,065 | 31.3 | 14,499 | 166,073,532 | 136,349 |
| 2003 | 1,363 | 21,653,042 | 22.6 | 15,886 | 201,489,450 | 147,828 |
| 2004 | 1,536 | 26,261,143 | 21.3 | 17,097 | 255,272,652 | 166,193 |
| 2005 | 1,733 | 31,329,225 | 19.3 | 18,078 | 332,199,210 | 191,690 |
| 2006 | 1,955 | 37,272,183 | 19.0 | 19,065 | 384,512,841 | 196,682 |
| 2007 | 2,123 | 42,666,000 | 14.5 | 20,097 | 430,172,373 | 202,625 |
| 2008 | 2,428 | 51,062,647 | 19.7 | 21,031 | 504,461,674 | 207,768 |
| 2009 | 2,591 | 59,089,591 | 15.7 | 22,806 | 566,228,807 | 218,537 |
| 2010 | 2,908 | 69,769,056 | 18.1 | 23,992 | 666,416,976 | 229,167 |
| 2011 | 3,256 | 81,637,650 | 17.0 | 25,073 | 796,704,561 | 244,688 |
| 2012 | 3,476 | 87,918,348 | 7.7 | 25,293 | 889,093,751 | 255,781 |
| 2013 | 3,810 | 96,465,575 | 9.7 | 25,319 | 980,669,280 | 257,394 |
| 2014 | 4,090 | 107,562,143 | 11.5 | 26,299 | 1,269,514,650 | 310,395 |
| 2015 | 4,410 | 116,217,259 | 8.0 | 26,353 | 1,351,258,733 | 306,408 |
| 2016 | 4,785 | 126,624,428 | 9.0 | 26,463 | 1,495,286,564 | 312,495 |
| 2017 | 5,091 | 139,611,686 | 10.3 | 27,423 | 1,845,299,461 | 362,463 |
| **2018** | **5,395** | **148,274,960** | **6.2** | **27,484** | **1,824,876,153** | **338,253** |

# SECTION E

## METHODS AND ASSUMPTIONS

# Valuation Methods

***Actuarial Cost Method –*** Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an individual entry-age actuarial cost method having the following characteristics:

(i) the annual normal costs for each individual active member, payable from the date of hire to the date of retirement, are sufficient to accumulate to the value of the member's benefits.

(ii) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

The entry-age actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's compensation between the entry age of the member and the assumed exit ages.

***Actuarial Accrued Liability –*** The actuarial accrued liability is the portion of actuarial present value allocated to service rendered prior to the valuation date, including experience gains and losses. The actuarial accrued liability was computed using the assumptions summarized in this report.

***Actuarial Value of System Assets –*** The actuarial value of assets recognizes assumed investment income fully each year. Differences between actual and assumed investment income are phased-in over a closed 7-year period subject to a 20% corridor. During periods when investment performance exceeds the assumed rate, actuarial value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, the actuarial value of assets will tend to be greater than market value.

***Financing of Unfunded Actuarial Accrued Liabilities –*** The actuarial value of assets were subtracted from the computed actuarial accrued liability. Any unfunded amount would be amortized as level percent-of-payroll over a closed period of 18 years. If the actuarial value of assets exceeded the actuarial accrued liability, the excess was amortized over an open period of 20 years and applied as a credit to reduce the normal cost which otherwise would be payable.

Active member payroll was assumed to increase 3.50% annually for the purpose of computing the amortization payment (credit) as a level percent-of-payroll for both Defined Benefit and Defined Contribution Plan members.

# Valuation Assumptions

***Funded Ratio –*** Unless otherwise indicated, a funded ratio measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

1. The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
2. The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amount of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon actuarial assumptions. A funded ratio measurement in this report of 100% is not synonymous with no required future contributions. If the funded ratio were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
3. The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

***Stabilization Reserve –*** Beginning with the June 30, 2007 valuation and with each subsequent valuation, if the actuarial value of assets exceeds the actuarial accrued liabilities, one half of this excess in each year is allocated to a Stabilization Reserve. The Stabilization Reserve is excluded from the calculation of the employer contribution rates. The Stabilization Reserve continues to accumulate as long as the plan is over-funded. Once the plan becomes under-funded, the Stabilization Reserve will be used to dampen increases in the employer contribution rates.

# Valuation Assumptions

Assumptions for this valuation are based on the most recent experience study performed in 2017***.***

***The rate of investment return*** was 7.40% a year, compounded annually net of investment and administrative expenses.

The assumed real return is the rate of return in excess of wage growth. Considering other assumptions used in the valuation, the 7.40% nominal rate translates to a net real return over wage growth of 3.90% a year.

***The rates of pay increase*** used for individual members are shown below. This assumption is used to project a member's current pay to the pay upon which Plan benefits will be based. This assumption was first used for the June 30, 2017 valuation of the Plan.

| | Salary Increase Assumptions For an Individual Member | | |
|---|---|---|---|
| Sample Ages | Merit & Seniority | Base (Economy) | Increase Next Year |
| 20 | 3.0% | 3.5% | 6.5% |
| 25 | 2.6% | 3.5% | 6.1% |
| 30 | 1.9% | 3.5% | 5.4% |
| 35 | 1.2% | 3.5% | 4.7% |
| 40 | 0.7% | 3.5% | 4.2% |
| 45 | 0.5% | 3.5% | 4.0% |
| 50 | 0.4% | 3.5% | 3.9% |
| 55 | 0.2% | 3.5% | 3.7% |
| 60 | 0.0% | 3.5% | 3.5% |

Active member payroll is assumed to grow at 3.50% per year.

***The price inflation*** component of the investment return rate and the wage inflation rate is assumed to be 2.50%.

# Valuation Assumptions

***Mortality Tables.*** The mortality rates utilized are based upon the RP-2014 tables, as extended, and include a margin for future mortality improvements projected using a fully generational improvement scale. The tables used were as follows:

- **Healthy Pre-Retirement:** The RP-2014 Employee Mortality Tables, extended via cubic spline, adjusted backward to 2006 using scale MP-2014, setting it as the 2017 base year, with future mortality improvements assumed each year using 75% of scale MP-2016.
- **Healthy Post-Retirement:** The RP-2014 Healthy Annuitant Mortality Tables, extended via cubic spline, adjusted backward to 2006 using scale MP-2014, setting it as the 2017 base year, with future mortality improvements assumed each year using 75% of scale MP-2016.
- **Disability Retirement:** The RP-2014 Disabled Mortality Table, extended via cubic spline, extended via cubic spline, adjusted backward to 2006 using scale MP-2014, setting it as the 2017 base year, with future mortality improvements assumed each year using 75% of scale MP-2016.

This assumption was first used for the June 30, 2017 valuation of the Plan.

| Sample Ages in 2018 | % Dying Next Year | | | |
|---|---|---|---|---|
| | Healthy Post-Retirement | | Disability Retirement | |
| | Males | Females | Males | Females |
| 40 | 0.2170% | 0.1812% | 1.5148% | 0.7828% |
| 45 | 0.3378% | 0.2427% | 2.0694% | 1.0560% |
| 50 | 0.4720% | 0.2870% | 2.3684% | 1.2346% |
| 55 | 0.6050% | 0.3738% | 2.4655% | 1.4943% |
| 60 | 0.8178% | 0.5934% | 2.7997% | 1.9434% |
| 65 | 1.2590% | 0.9726% | 3.6222% | 2.5212% |
| 70 | 2.0186% | 1.5507% | 4.8567% | 3.3988% |
| 75 | 3.2847% | 2.4837% | 6.6472% | 4.8689% |
| 80 | 5.4547% | 4.1117% | 9.3448% | 7.2024% |

| Sample Ages in 2018 | % Dying Next Year | |
|---|---|---|
| | Healthy Pre-Retirement | |
| | Males | Females |
| 50 | 0.1566% | 0.1257% |
| 55 | 0.2353% | 0.1900% |
| 60 | 0.3947% | 0.3071% |
| 65 | 0.7570% | 0.4913% |

# Valuation Assumptions

***Mortality Tables (continued)***

| Sample Attained Ages | Healthy Post-Retirement Future Life Expectancy (Years)* | | Healthy Pre-Retirement Future Life Expectancy (Years)* | | Disabled Retirement Future Life Expectancy (Years)* | |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women |
| 55 | 28.09 | 30.61 | 31.65 | 33.44 | 19.83 | 23.49 |
| 60 | 23.63 | 25.92 | 26.74 | 28.53 | 16.83 | 19.94 |
| 65 | 19.38 | 21.50 | 22.08 | 23.77 | 13.94 | 16.63 |
| 70 | 15.46 | 17.38 | 17.77 | 19.19 | 11.32 | 13.51 |
| 75 | 11.91 | 13.58 | 13.84 | 14.85 | 8.94 | 10.64 |
| 80 | 8.81 | 10.16 | 10.32 | 10.76 | 6.84 | 8.15 |

** Based on retirements in 2018. Retirements in future years will reflect improvements in life expectancy.*

***Retirement Rates:*** Age-related rates for members hired before January 1, 2012 are shown below, and were first used for the June 30, 2017 valuation of the Plan:

| Age at Retirement | Rates |
|---|---|
| 60 | 45% |
| 61 | 45% |
| 62 | 45% |
| 63 | 45% |
| 64 | 45% |
| 65 | 45% |
| 66 | 45% |
| 67 | 45% |
| 68 | 45% |
| 69 | 45% |
| 70 | 45% |
| 71 | 45% |
| 72 | 45% |
| 73 | 45% |
| 74 | 45% |
| 75 | 100% |

These retirement rates are applicable to employees attaining age 62 before attaining 20 (25 for dispatchers) years of service.

# Valuation Assumptions

Service-related rates for members hired before January 1, 2012 are shown below:

| Service at Retirement | CORP |
|---|---|
| 20 | 30% |
| 21 | 28% |
| 22 | 19% |
| 23 | 17% |
| 24 | 13% |
| 25 | 26% |
| 26 | 26% |
| 27 | 19% |
| 28 | 19% |
| 29 | 19% |
| 30 | 27% |
| 31 | 27% |
| 32 | 40% |
| 33 | 40% |
| 34 | 50% |
| 35 | 50% |
| 36 | 60% |
| 37 | 100% |

These retirement rates are applicable to employees attaining 20 (25 for dispatchers) years of service before attaining age 62.

Age-related rates for members hired after January 1, 2012 are shown below:

| Age at Retirement | CORP |
|---|---|
| 53 | 40% |
| 54 | 40% |
| 55 | 30% |
| 56 | 15% |
| 57 | 15% |
| 58 | 30% |
| 59 | 30% |
| 60 | 65% |
| 61 | 65% |
| 62 | 100% |

# Valuation Assumptions

***Rates of separation from active membership*** used in the valuation are shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment. This assumption was first used for the June 30, 2017 valuation of the Plan.

| Sample Ages | Years of Service | % of Active Members Separating within Next Year |
|---|---|---|
| All | 0 | 23.00% |
| | 1 | 20.00% |
| | 2 | 16.50% |
| | 3 | 14.50% |
| | 4 | 13.00% |
| | 5 | 10.50% |
| | 6 | 9.50% |
| | 7 | 9.00% |
| | 8 | 8.50% |
| | 9 | 8.50% |
| | 10 | 8.50% |
| | 11 | 6.00% |
| | 12 | 5.00% |
| | 13 | 4.50% |
| | 14 | 3.00% |
| | 15 | 3.00% |
| | 16 | 3.00% |
| | 17 | 2.00% |
| | 18 | 2.00% |
| | 19 | 2.00% |

***Rates of disability*** among active members used in the valuation are shown below, and were first used for the June 30, 2017 valuation of the Plan.

| Sample Ages | % of Active Members Becoming Disabled within Next Year |
|---|---|
| 20 | 0.03% |
| 25 | 0.03% |
| 30 | 0.03% |
| 35 | 0.04% |
| 40 | 0.05% |
| 45 | 0.06% |
| 50 | 0.08% |
| 55 | 0.08% |

# Summary of Assumptions Used
# June 30, 2018
# Miscellaneous and Technical Assumptions

| | |
|---|---|
| **Marriage Assumption:** | 75% of males and 50% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes. |
| **Pay Increase Timing:** | Six months after the valuation date. This means that the pays received are assumed to be annual rates of pay on the valuation date as opposed to W-2 type earnings for the prior 12 months. |
| **Decrement Timing:** | Decrements of all types are assumed to occur mid-year. |
| **Eligibility Testing:** | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| **Decrement Relativity:** | Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects. |
| **Decrement Operation:** | Disability and turnover decrements do not operate during retirement eligibility. |
| **Service Credit Accruals:** | It is assumed that members accrue one year-of-service credit per year. |
| **Incidence of Contributions:** | Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. |
| **Normal Form of Benefit:** | A straight life payment is the assumed normal form of benefit for members who are not married, and the 80% Joint and Survivor form of payment with no reduction, for married members. 75% of males and 50% of females are assumed to be married at the time of retirement. |
| **Benefit Service:** | Exact fractional service is used to determine the amount of benefit payable. |
| **Health Care Utilization:** | 60% of future retirees are expected to utilize retiree health care. 75% of males and 50% of females are assumed to be married. |
| **Assumed Future Cost-of-Living Adjustments (COLA):** | The 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. We have assumed that to be 1.75% for this valuation. |

# Summary of Assumptions Used
# June 30, 2018
# Miscellaneous and Technical Assumptions

| | |
|---|---|
| **Interest on Reverse DROP:** | The lump sum distribution is credited as though it accrued monthly from the Reverse DROP date to the date the member elected to participate in the Reverse DROP (plus interest equal to the yield on a five (5) year Treasury note as of the first day of the month as published by the Federal Reserve Board). For purposes of this valuation we used an interest rate of 2%. |
| **Financing of Unfunded Actuarial Accrued Liabilities (Money in the Pipes):** | The rate-setting valuation projects the unfunded actuarial accrued liability to the beginning of the applicable fiscal year to determine the applicable unfunded amortization rate. |

# SECTION F

## PLAN PROVISIONS

# Summary of Plan Provisions
# Valued and/or Considered

***Membership:*** Designated positions for the following employers that elect to join the Plan are eligible to participate in the CORP if the employee's customary employment is for at least forty (40) hours per week, or as defined by statute. A.R.S. § 38-881(13):

- For a County: A county detention officer and non-uniformed employees of a sheriff's department hired before July 1, 2018 whose primary duties require direct inmate contact.
- For the State Department of Corrections and the Department of Juvenile Correction: Specific positions are eligible to participate. Refer to the statute for specific positions.
- For a City or Town: A City or Town Detention Officer.
- For an employer of an eligible group as defined in A.R.S. § 38-842: Full-time dispatchers.
- For the judiciary: Probation and surveillance officers and those positions designated by the Local Board. Also includes juvenile detention officers hired before July 1, 2018.
- For the Department of Public Safety: State detention officers.

Dispatchers hired after November 24, 2009 must participate in the Arizona State Retirement System. A.R.S. § 38-902(C).

***Average Monthly Compensation***

**For members hired before January 1, 2012:**

One-thirty-sixth of total compensation paid to member during the three years, out of the last 10 years of credited service, in which the amount paid was highest. Compensation is the amount including base salary, overtime pay, shift differential pay and holiday pay, paid to an employee on a regular payroll basis and longevity pay paid at least every six months for which contributions are made to the System.

**For members hired after January 1, 2012:**

One-sixtieth of total compensation paid to member during the five years, out of the last 10 years of credited service, in which the amount paid was highest. Compensation is the amount including base salary, overtime pay, shift differential pay and holiday pay, paid to an employee on a regular payroll basis and longevity pay paid at least every six months for which contributions are made to the System. For members hired on or after July 1, 2018, pensionable compensation is capped at $70,000 annually.

***Normal Retirement (no reduction for age)***

**For members hired before January 1, 2012:**

A corrections officer may retire upon meeting one of the following age and service requirements:

a) Any age with 20 (25 for dispatchers) or more years of credited service (effective August 9, 2001);
b) Age 62 years with 10 or more years of credited service; or
c) A combination of age and credited service equal to 80 (effective July 1, 1995).

The amount of normal pension at 20 years of credited service is 50% of average monthly salary with 2% increments for every year over 20 years of credited service up to 25 years of credited service. With 25 or more years of credited service the accrual rate is 2.5% for each year. The normal pension for someone with less than 20 years of credited service is 2.5% for each year of credited service.

## Summary of Plan Provisions Valued and/or Considered

The maximum amount payable as a normal retirement pension is 80% of the average monthly compensation.

**For members hired after January 1, 2012 and before July 1, 2018:**
First day of month following the attainment of age 52.5 and completion of 25 years of service or the attainment of age 62 and completion of 10 years of service.

The amount of monthly normal pension is based on credited service and average monthly compensation as follows:

- ***Age 62 and 10 years of service,*** 2.5% of average monthly compensation per year of credited service.
- ***Age 52.5 with 25 or more years of credited service,*** 62.5% of average monthly compensation, plus 2.5% of average monthly compensation for each year of credited service over 25.
- ***Age 52.5 with 25 years of service, but less than 25 years of credited service,*** 2.5% of average monthly compensation multiplied by total credited service.

The maximum amount payable as a normal retirement pension is 80% of the average monthly compensation.

**For members hired after July 1, 2018 (AOC Probation and Surveillance Only):**
First day of month following the attainment of age 55 and completion of 10 years of credited service.

The amount of monthly normal pension is equal to the member's average monthly compensation multiplied by the number of whole and fractional years of credited service multiplied by the following:

- ***At least 10 but less than 15 years of credited service:*** 1.25%
- ***At least 15 but less than 20 years of credited service:*** 1.50%
- ***At least 20 but less than 22 years of credited service:*** 1.75%
- ***At least 22 but less than 25 years of credited service:*** 2.00%
- ***At least 25 years of credited service:*** 2.25%

The maximum amount payable as a normal retirement pension is 80% of the average monthly compensation.

***Early Retirement (reduction for age):*** Members who are hired on or after July 1, 2018 and who have earned at least 10 years of credited service may retire at 52.5 of age and will receive an actuarially equivalent retirement benefit to the benefit listed above.

***Vested Termination (deferred annuity):*** Only available for members hired before January 1, 2012. Termination of covered position employment with 10 or more years of credited service. Pension is calculated based on twice the member's accumulated contributions with payments commencing at age 62. Benefit is forfeited if accumulated contributions are refunded.

# Summary of Plan Provisions
# Valued and/or Considered

***Disability Retirement.*** A member who is injured in the performance of his duties which totally and permanently prevent him from performing a reasonable range of duties in his department and was the result of either physical contact with an inmate, responding to a confrontational situation with an inmate or a job-related motor vehicle accident may be retired under accidental disability. A corrections officer who becomes incapacitated for any gainful employment, as the direct and proximate result of performance of duty as a corrections officer, may be retired by the Board of Trustees under total and permanent disability. The amount of pension for both types of disability is 50 percent of average monthly salary.

A member who has a total and permanent disability that prevents the performance of a reasonable range of duties in his department may be retired by the Board of Trustees under an ordinary disability (non-duty related). The amount of the pension is a percentage of normal retirement benefit. The percentage based on credited service divided by 20 (25 for dispatchers).

***DROP***. Beginning July 1, 2006, the CORP shall offer the Reverse Deferred Retirement Option Plan (Reverse DROP) to members that are eligible for a normal pension (based on service and age) applicable to a membership date that is either prior to, or after January 1, 2012 (who is not awarded an accidental, ordinary or total and permanent disability pension). Under the Reverse DROP, the member must voluntarily and irrevocably elect to terminate employment and receive a normal retirement upon participation in the Reverse DROP. The Reverse DROP date is the first day of the month immediately following completion of required credited service, or a date not more than sixty (60) consecutive months before the date the member elects to participate in the Reverse DROP, whichever is later.

The member's pension will be calculated using the factors of credited service and average monthly benefit compensation in effect on the Reverse DROP Date. The lump sum distribution is credited as though it accrued monthly from the Reverse DROP date to the date the member elected to participate in the Reverse DROP (plus interest equal to the yield on a five (5) year Treasury note as of the first day of the month as published by the Federal Reserve Board).

***Survivor Pensions.*** Payable to the eligible beneficiary of a retired corrections officer or an active corrections officer. An eligible beneficiary is a surviving spouse who was married to the retired or active corrections officer for at least two years. A surviving spouse's pension terminates upon death. The amount of a surviving spouse's pension is 80% of the pension being paid the deceased retired corrections officer and 40% (100% if duty-related) of the average monthly salary of the deceased active corrections officer. Eligible surviving children are paid equal shares of the pension which would have been payable to a surviving spouse if a surviving spouse pension is not being paid. If no pension is payable because of the death of an active member, a refund of twice the member's accumulated contributions is paid to the beneficiary.

***Other Terminations.*** The member is paid a refund of accumulated member contributions. Members hired before January 1, 2012 also receive an additional amount if the member has at least five years of service credited. The additional amount is a percent, based on service credit, of the member contribution amount, ranging from 25% (with five years of service credited) to 100% (with 10 or more years of service credited). Members hired on or after January 1, 2012 receive interest.

# Summary of Plan Provisions
# Valued and/or Considered

***Post-Retirement Adjustments***
**For members hired before July 1, 2018:**
Each retired member or survivor of a retired member is eligible to receive a compounding cost-of-living adjustment in the base benefit. The first payment shall be made on July 1, 2018 and every July 1 thereafter.

The 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. The cost-of-living adjustment will not exceed 2% per year.

**For members hired on or after July 1, 2018:**
Eligible benefit recipients may receive a cost-of-living adjustment (COLA) beginning the earlier of the first calendar year after the seventh anniversary of the retiree's retirement or when the retiree is or would have been 60 years of age. The COLA is based on the Phoenix-Mesa CPI and the funded status of the pool that includes members hired on or after July 1, 2018.

***Post-Retirement Health Insurance Subsidy.*** Payable on behalf of retired members and survivors who elect coverage provided by the state or participating employer. The monthly amounts cannot exceed:

| Member Only | | With Dependents | | |
|---|---|---|---|---|
| Not Medicare Eligible | Medicare Eligible | All Not Medicare Eligible | All Medicare Eligible | One With Medicare |
| $150 | $100 | $260 | $170 | $215 |

***Member Contributions.***

**For members hired before July 1, 2018:**
For fiscal years 2007/2008 and 2008/2009, the member contribution rate is 7.96% pursuant to legislation adopted in 2005. Effective after 9/26/2008, non-dispatcher members contribute 8.41%, or a 50/50 split between employer and employee, whichever is lower, until the Plan is 100% funded. Minimum employee contribution rate of 7.65%, minimum employer contribution rate of 6%. Dispatcher contribution rate is .45% less than the non-dispatcher rate until the plan is 100% funded then rates are equal thereafter.

**For members hired on or after July 1, 2018:**
The member contribution is actuarially calculated annually, and is equal to 66.7% of the normal cost plus 50% of the actuarially determined amount required to amortize the total unfunded accrued liability for members hired on or after July 1, 2018.

# Summary of Plan Provisions
# Valued and/or Considered

***Employer Contributions.***

**For members hired before July 1, 2018:**
Percent of payroll normal cost plus 30-year (18 years remaining as of June 30, 2018) amortization of unfunded actuarial accrued liability (20-year amortization for credit). The minimum employer contribution rate is 6% for fiscal years beginning with FY 2007/2008 (5% for units under 5% as of June 30, 2005 valuation).

**For members hired on or after July 1, 2018:**
33.3% of the payroll normal cost plus 50% of the actuarially determined amount required to amortize the total unfunded accrued liability for members hired on or after July 1, 2018 over a layered 10 year period, plus a legacy cost to help pay off the employers unfunded liability for members hired before July 1, 2018.

# SECTION G

## FUNDING POLICY

# Actuarial Funding Policy

## Introduction

The purpose of this Actuarial Funding Policy is to record the funding objectives and policy set by the Board for the Arizona Public Safety Personnel Retirement System (PSPRS). The Board establishes this Funding Policy to help ensure the systematic funding of future benefit payments for members of the Retirement System.

In 2012, the Governmental Accounting Standards Board (GASB) approved two new financial reporting standards. GASB Statement No. 67, "Financial Reporting for Pension Plans" replaces the requirements of Statement No. 25. GASB Statement No. 68, "Accounting and Financial Reporting for Pensions" replaces the requirements of Statements No. 27 and No. 50. Prior to the changes, the Annual Required Contribution (ARC) rate was used as a basis for funding decisions. The new GASB statements separate accounting cost (expense) from funding cost (contributions), necessitating the creation of this funding policy.

This funding policy shall be reviewed by the Board annually for several years following initial adoption until the next experience study. Subsequently, it shall be reviewed every five years in conjunction with the experience study.

## Funding Objectives

1. Maintain adequate assets so that current plan assets plus future contributions and investment earnings are sufficient to fund all benefits expected to be paid to members and their beneficiaries.
2. Maintain stability of employer contribution rates, consistent with other funding objectives.
3. Maintain public policy goals of accountability and transparency. Each policy element is clear in intent and effect, and each should allow an assessment of whether, how and when the funding requirements of the plan will be met.
4. Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring those costs to future members and employers.
5. Provide a reasonable margin for adverse experience to help offset risks.
6. Continue progress of systematic reduction of the Unfunded Actuarial Accrued Liabilities (UAAL).

# Actuarial Funding Policy

## Elements of Actuarial Funding Policy

**1. Actuarial Cost Method**

a. The Individual Entry Age Normal level percent-of-pay actuarial cost method of valuation shall be used in determining Actuarial Accrued Liability (AAL) and Normal Cost. Differences in the past between assumed experience and actual experience ("actuarial gains and losses") shall become part of the AAL. The Normal Cost shall be determined on an individual basis for each active member.

**2. Asset Smoothing Method**

a. The investment gains or losses of each valuation period, resulting from the difference between actual investment return and assumed investment return, shall be recognized annually in level amounts over 7 years in calculating the Funding Value of Assets

b. The Funding Value of Assets so determined shall be subject to a 20% corridor relative to Market Value of Assets.

**3. Amortization Method**

a. The Funding Value of Assets are subtracted from the computed AAL. Any unfunded amount is amortized as a level percent-of-payroll over a closed period. If the Funding Value of Assets exceeds the AAL, the excess is amortized over an open period of 20 years and applied as a credit to reduce the Normal Cost otherwise payable.

**4. Funding Target**

a. The targeted funded ratio shall be 100%.

b. The maximum amortization period shall be 30 years.

c. If the funded ratio is between 100% and 120%, a minimum contribution equal to the Normal Cost will be made.

## Elements of Actuarial Funding Policy

**5. Risk Management**

a. Assumption Changes

- The actuarial assumptions used shall be those last adopted by the PSPRS Board based on the most recent experience study and upon the advice and recommendation of the actuary. In accordance with best practices, the actuary shall conduct an experience study every five years. The results of the study shall be the basis for the actuarial assumption changes recommended to the PSPRS Board.
- The actuarial assumptions can be updated during the 5-year period if significant plan design changes or other significant events occur, as advised by the actuary.

b. Amortization Method

- The amortization method, Level Percent Closed, will ensure full payment of the UAAL over a finite, systematically decreasing period not to exceed 30 years. The amortization period will be reviewed once the period reaches 15 years.

c. Risk Measures

- The following risk measures will be annually determined to provide quantifiable measurements of risk and their movement over time.

  (i) Classic measures currently determined

  – Funded ratio (assets/liability)

  (ii) UAAL/Total Payroll

  – Measures the risk associated with contribution decreases relative impact on the ability to fund the UAAL. An increase in this measure indicates an increase in contribution risk.

  (iii) Total Liability/Total Payroll

  – Measures the risk associated with the ability to respond to liability experience through adjustments in contributions. An increase in this measure indicates an increase in experience risk.

## Glossary

1. **Actuarial Accrued Liability (AAL):** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.”
2. **Actuarial Assumptions:** Estimates of future plan 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.
3. **Actuarial Cost Method:** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”
4. **Actuarial Gain (Loss):** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used. For example, if during a given year the assets earn more than the investment return assumption, the amount of earnings above the assumption will cause an unexpected reduction in UAAL, or “actuarial gain” as of the next valuation. These include contribution gains and losses that result from actual contributions made being greater or less than the level determined under the policy.
5. **Actuary:** A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries (MAAA). The Society of Actuaries (SOA) is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. The SOA administers a series of examinations leading initially to Associateship and the designation ASA and ultimately to Fellowship with the designation FSA.
6. **Amortization:** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.
7. **Entry Age Normal Actuarial Cost Method:** A funding method that calculates the Normal Cost as a level percentage-of-pay over the working lifetime of the plan’s members.
8. **Experience Study:** An actuarial investigation of demographic and economic experiences of the system during the period studied. The investigation is made for the purpose of updating the actuarial assumptions used in valuing the actuarial liabilities.

# Actuarial Funding Policy

9. **Funding Value of Assets**: The value of current plan assets recognized for valuation purposes. Generally based on a phased-in recognition of all or a portion of market related investment return. Sometimes referred to as Actuarial Value of Assets.
10. **Market Value of Assets:** The fair value of plan assets as reported in the plan's audited financial statements.
11. **Normal Cost (NC):** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.
12. **Unfunded Actuarial Accrued Liability (UAAL):** The positive difference, if any, between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

# APPENDIX I

## ALTERNATIVE PENSION CONTRIBUTION RECOMMENDATION – TIER 1/2 (CLOSED PLAN BASIS)

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# Alternative Pension Contribution Recommendation – Tier 1/2 (Closed Plan Basis)

The CORP Statutory contribution rate is developed using not only payroll of the members receiving Defined Benefits (DB) from this Plan, but also factors in payroll for future members who receive no Defined Benefits from this plan, but rather receive Defined Contribution (DC) plan benefits from a different plan. In this way, the statutory contribution is based on a level-percent of payroll approach that considers both DB and DC pay.

When considering the Defined Benefit Plan on its own, level percent financing cannot apply due to the ever decreasing payroll for members covered by the Plan. In this case, unfunded liabilities are amortized on a level-dollar basis shown in the development that follows below.

The CORP statutory contribution rates for Tiers 1 & 2 are shown on page A-2. The information below is informational only.

| | **Fiscal Year Ending 2020** |
|---|---|
| Pension | |
| Total normal cost requirement | 16.08% |
| Less member contributions | 8.41 |
| Employer normal cost requirement | 7.67% |
| Amortization of unfunded liabilities | 25.40% |
| **Total recommended pension contribution rate** | **33.07%** |
| **Total recommended pension contribution amount** | **$ 204,792,593** |

# APPENDIX II

## SUMMARY OF POPULATION DATA BY INDIVIDUAL EMPLOYERS

| Division Number | Employer Name | Number of Actives | Active Payroll | Number of Retirees | Annual Retiree Benefits | Number of Inactive | Inactive Benefits |
|---|---|---|---|---|---|---|---|
| 500 | DEPARTMENT OF CORRECTIONS - Detention | 8,098 | $ 321,870,163 | 3,330 | $ 83,193,617 | 1,237 | $ 13,049,882 |
| 501 | DEPT OF JUVENILE CORRECTIONS - Detention | 376 | 14,280,604 | 294 | 7,757,846 | 232 | 2,260,686 |
| 502 | PINAL COUNTY - Detention | 162 | 8,195,537 | 40 | 1,191,075 | 30 | 229,498 |
| 503 | GILA COUNTY - Detention | 59 | 2,264,452 | 12 | 211,483 | 31 | 237,178 |
| 504 | GRAHAM COUNTY - Detention | 39 | 1,387,218 | 5 | 117,279 | 15 | 121,306 |
| 505 | MARICOPA COUNTY - Detention | 2,005 | 98,700,459 | 587 | 18,034,895 | 360 | 3,791,871 |
| 506 | CITY OF AVONDALE - Detention | 10 | 598,932 | 1 | 11,787 | 3 | 17,507 |
| 507 | LA PAZ COUNTY - Detention | 29 | 1,024,963 | 1 | 12,920 | 2 | 10,820 |
| 510 | YUMA COUNTY - Detention | 156 | 6,405,458 | 31 | 781,755 | 57 | 469,009 |
| 515 | PIMA COUNTY - Detention | 507 | 21,438,572 | 204 | 5,934,169 | 135 | 1,076,060 |
| 520 | APACHE COUNTY - Detention | 25 | 718,470 | 5 | 89,555 | 15 | 24,802 |
| 525 | COCHISE COUNTY - Detention | 61 | 2,281,911 | 35 | 578,187 | 24 | 144,035 |
| 530 | COCONINO COUNTY - Detention | 106 | 4,482,919 | 17 | 458,157 | 63 | 383,250 |
| 535 | MOHAVE COUNTY - Detention | 135 | 4,160,136 | 17 | 327,024 | 58 | 273,216 |
| 540 | SANTA CRUZ COUNTY - Detention | 30 | 1,003,033 | 5 | 125,573 | 28 | 201,422 |
| 545 | NAVAJO COUNTY - Detention | 59 | 1,973,893 | 11 | 214,634 | 33 | 69,183 |
| 550 | YAVAPAI COUNTY - Detention | 200 | 8,189,016 | 47 | 1,004,794 | 106 | 790,140 |
| 555 | PINAL COUNTY - Dispatchers | 7 | 388,783 | 2 | 68,324 | 10 | 141,606 |
| 556 | TOWN OF ORO VALLEY - Dispatchers | 4 | 230,894 | 5 | 136,724 | 3 | 82,009 |
| 557 | TOWN OF MARANA - Dispatchers | 7 | 407,607 | - | - | 2 | 3,663 |
| 558 | GILA COUNTY - Dispatchers | 5 | 188,062 | 3 | 84,311 | 4 | 55,340 |
| 559 | TOWN OF WICKENBURG - Dispatchers | 3 | 135,223 | 2 | 31,606 | 1 | 2,322 |
| 560 | GRAHAM COUNTY - Dispatchers | 4 | 157,771 | - | - | 4 | 63,177 |
| 561 | YAVAPAI COUNTY - Dispatchers | 4 | 180,285 | 1 | 40,941 | 1 | 69,069 |
| 562 | CITY OF SOMERTON - Dispatchers | 4 | 156,434 | 1 | 33,721 | 1 | 7,507 |
| 563 | DEPARTMENT OF PUBLIC SAFETY - Dispatchers | 24 | 1,311,053 | 17 | 617,045 | 5 | 179,699 |
| 564 | DEPARTMENT OF PUBLIC SAFETY - Detention | 1 | 56,871 | - | - | 1 | 4,266 |
| 575 | ADMINISTRATIVE OFFICE OF THE COURTS | 2,215 | 117,081,292 | 722 | 27,217,538 | 540 | 6,216,516 |
| | TOTAL | 14,335 | $ 619,270,011 | 5,395 | $ 148,274,960 | 3,001 | $ 29,975,039 |

# APPENDIX III

## SUMMARY OF PENSION LIABILITY AND ASSET INFORMATION BY INDIVIDUAL EMPLOYERS

| Division Number | Employer Name | Pension AAL | Pension Assets | Net Assets | Funded Percent | Unfunded Liability |
|---|---|---|---|---|---|---|
| 500 | DEPARTMENT OF CORRECTIONS - Detention | $ 1,787,870,305 | $ 955,907,598 | $ 955,907,598 | 53.50% | $ 831,962,707 |
| 501 | DEPT OF JUVENILE CORRECTIONS - Detention | 129,185,418 | 60,384,427 | 60,384,427 | 46.70% | 68,800,991 |
| 502 | PINAL COUNTY - Detention | 41,774,045 | 28,784,341 | 28,784,341 | 68.90% | 12,989,704 |
| 503 | GILA COUNTY - Detention | 6,771,272 | 5,117,096 | 5,117,096 | 75.60% | 1,654,176 |
| 504 | GRAHAM COUNTY - Detention | 2,847,681 | 2,293,721 | 2,293,721 | 80.50% | 553,960 |
| 505 | MARICOPA COUNTY - Detention | 502,309,142 | 273,215,903 | 273,215,903 | 54.40% | 229,093,239 |
| 506 | CITY OF AVONDALE - Detention | 2,369,066 | 1,597,613 | 1,597,613 | 67.40% | 771,453 |
| 507 | LA PAZ COUNTY - Detention | 2,182,224 | 1,116,253 | 1,116,253 | 51.20% | 1,065,971 |
| 510 | YUMA COUNTY - Detention | 22,222,005 | 14,260,738 | 14,260,738 | 64.20% | 7,961,267 |
| 515 | PIMA COUNTY - Detention | 128,635,234 | 61,138,139 | 61,138,139 | 47.50% | 67,497,095 |
| 520 | APACHE COUNTY - Detention | 2,328,500 | 1,581,088 | 1,581,088 | 67.90% | 747,412 |
| 525 | COCHISE COUNTY - Detention | 11,831,346 | 6,230,165 | 6,230,165 | 52.70% | 5,601,181 |
| 530 | COCONINO COUNTY - Detention | 14,701,970 | 9,510,634 | 9,510,634 | 64.70% | 5,191,336 |
| 535 | MOHAVE COUNTY - Detention | 7,682,193 | 8,177,537 | 8,177,537 | 106.40% | (495,344) |
| 540 | SANTA CRUZ COUNTY - Detention | 2,806,768 | 2,647,737 | 2,647,737 | 94.30% | 159,031 |
| 545 | NAVAJO COUNTY - Detention | 5,111,101 | 3,955,191 | 3,955,191 | 77.40% | 1,155,910 |
| 550 | YAVAPAI COUNTY - Detention | 27,495,145 | 15,439,790 | 15,439,790 | 56.20% | 12,055,355 |
| 555 | PINAL COUNTY - Dispatchers | 2,897,189 | 1,727,814 | 1,727,814 | 59.60% | 1,169,375 |
| 556 | TOWN OF ORO VALLEY - Dispatchers | 2,945,307 | 1,337,558 | 1,337,558 | 45.40% | 1,607,749 |
| 557 | TOWN OF MARANA - Dispatchers | 2,068,889 | 1,424,430 | 1,424,430 | 68.80% | 644,459 |
| 558 | GILA COUNTY - Dispatchers | 2,128,888 | 1,407,642 | 1,407,642 | 66.10% | 721,246 |
| 559 | TOWN OF WICKENBURG - Dispatchers | 763,011 | 500,916 | 500,916 | 65.60% | 262,095 |
| 560 | GRAHAM COUNTY - Dispatchers | 633,328 | 683,386 | 683,386 | 107.90% | (50,058) |
| 561 | YAVAPAI COUNTY - Dispatchers | 1,236,253 | 796,942 | 796,942 | 64.50% | 439,311 |
| 562 | CITY OF SOMERTON - Dispatchers | 1,306,342 | 610,247 | 610,247 | 46.70% | 696,095 |
| 563 | DEPARTMENT OF PUBLIC SAFETY - Dispatchers | 15,911,027 | 10,245,441 | 10,245,441 | 64.40% | 5,665,586 |
| 564 | DEPARTMENT OF PUBLIC SAFETY - Detention | 253,896 | 139,936 | 139,936 | 55.10% | 113,960 |
| 575 | ADMINISTRATIVE OFFICE OF THE COURTS | 777,815,226 | 426,738,500 | 426,738,500 | 54.90% | 351,076,726 |
| | TOTAL | $ 3,506,082,771 | $ 1,896,970,783 | $ 1,896,970,783 | | $ 1,609,111,988 |

# APPENDIX IV

## SUMMARY OF PENSION CONTRIBUTION INFORMATION BY INDIVIDUAL EMPLOYERS

| Division Number | Employer Name | Pension ER NC% | Pension UAL Pmt % | Calculated ER Cont | Required ER Cont | Statutory Minimum |
|---|---|---|---|---|---|---|
| 500 | DEPARTMENT OF CORRECTIONS - Detention | 7.68% | 19.83% | 27.51% | 27.51% | N/A |
| 501 | DEPT OF JUVENILE CORRECTIONS - Detention | 7.74% | 36.91% | 44.65% | 44.65% | N/A |
| 502 | PINAL COUNTY - Detention | 8.29% | 12.07% | 20.36% | 20.36% | N/A |
| 503 | GILA COUNTY - Detention | 7.81% | 5.59% | 13.40% | 13.40% | N/A |
| 504 | GRAHAM COUNTY - Detention | 6.65% | 2.99% | 9.64% | 9.64% | N/A |
| 505 | MARICOPA COUNTY - Detention | 7.74% | 17.79% | 25.53% | 25.53% | N/A |
| 506 | CITY OF AVONDALE - Detention | 8.37% | 9.72% | 18.09% | 18.09% | N/A |
| 507 | LA PAZ COUNTY - Detention | 6.14% | 8.18% | 14.32% | 14.32% | N/A |
| 510 | YUMA COUNTY - Detention | 7.26% | 9.46% | 16.72% | 16.72% | N/A |
| 515 | PIMA COUNTY - Detention | 7.37% | 24.18% | 31.55% | 31.55% | N/A |
| 520 | APACHE COUNTY - Detention | 6.78% | 8.04% | 14.82% | 14.82% | N/A |
| 525 | COCHISE COUNTY - Detention | 7.15% | 18.97% | 26.12% | 26.12% | N/A |
| 530 | COCONINO COUNTY - Detention | 7.13% | 8.76% | 15.89% | 15.89% | N/A |
| 535 | MOHAVE COUNTY - Detention | 6.82% | 0.00% | 6.82% | 6.82% | N/A |
| 540 | SANTA CRUZ COUNTY - Detention | 6.19% | 1.11% | 7.30% | 7.30% | N/A |
| 545 | NAVAJO COUNTY - Detention | 6.99% | 4.35% | 11.34% | 11.34% | N/A |
| 550 | YAVAPAI COUNTY - Detention | 7.27% | 11.19% | 18.46% | 18.46% | N/A |
| 555 | PINAL COUNTY - Dispatchers | 6.93% | 23.40% | 30.33% | 30.33% | N/A |
| 556 | TOWN OF ORO VALLEY - Dispatchers | 6.42% | 53.52% | 59.94% | 59.94% | N/A |
| 557 | TOWN OF MARANA - Dispatchers | 7.12% | 12.07% | 19.19% | 19.19% | N/A |
| 558 | GILA COUNTY - Dispatchers | 7.35% | 29.25% | 36.60% | 36.60% | N/A |
| 559 | TOWN OF WICKENBURG - Dispatchers | 8.29% | 14.87% | 23.16% | 23.16% | N/A |
| 560 | GRAHAM COUNTY - Dispatchers | 7.35% | 0.00% | 7.35% | 7.35% | N/A |
| 561 | YAVAPAI COUNTY - Dispatchers | 8.39% | 18.63% | 27.02% | 27.02% | N/A |
| 562 | CITY OF SOMERTON - Dispatchers | 7.96% | 34.07% | 42.03% | 42.03% | N/A |
| 563 | DEPARTMENT OF PUBLIC SAFETY - Dispatchers | 7.00% | 33.41% | 40.41% | 40.41% | N/A |
| 564 | DEPARTMENT OF PUBLIC SAFETY - Detention | 11.20% | 15.37% | 26.57% | 26.57% | N/A |
| 575 | ADMINISTRATIVE OFFICE OF THE COURTS | 7.75% | 22.96% | 30.71% | 30.71% | N/A |
| | TOTAL | 7.67% | 19.92% | 27.59% | 27.59% | |

# APPENDIX V

## SUMMARY OF HEALTH LIABILITY AND ASSET INFORMATION BY INDIVIDUAL EMPLOYERS

| Division Number | Employer Name | Health AAL | Health Assets | Funded Percent | Unfunded Liability |
|---|---|---|---|---|---|
| 500 | DEPARTMENT OF CORRECTIONS - Detention | $ 63,299,864 | $ 79,231,170 | 125.20% | $ (15,931,306) |
| 501 | DEPT OF JUVENILE CORRECTIONS - Detention | 4,142,751 | 6,508,187 | 157.10% | (2,365,436) |
| 502 | PINAL COUNTY - Detention | 947,524 | 1,547,508 | 163.30% | (599,984) |
| 503 | GILA COUNTY - Detention | 197,490 | 375,176 | 190.00% | (177,686) |
| 504 | GRAHAM COUNTY - Detention | 64,992 | 86,247 | 132.70% | (21,255) |
| 505 | MARICOPA COUNTY - Detention | 11,435,375 | 17,541,404 | 153.40% | (6,106,029) |
| 506 | CITY OF AVONDALE - Detention | 50,232 | 44,792 | 89.20% | 5,440 |
| 507 | LA PAZ COUNTY - Detention | 59,843 | - | 0.00% | 59,843 |
| 510 | YUMA COUNTY - Detention | 427,827 | 1,178,218 | 275.40% | (750,391) |
| 515 | PIMA COUNTY - Detention | 2,871,406 | 3,996,849 | 139.20% | (1,125,443) |
| 520 | APACHE COUNTY - Detention | 76,525 | 192,066 | 251.00% | (115,541) |
| 525 | COCHISE COUNTY - Detention | 327,988 | 717,502 | 218.80% | (389,514) |
| 530 | COCONINO COUNTY - Detention | 418,896 | 514,002 | 122.70% | (95,106) |
| 535 | MOHAVE COUNTY - Detention | 228,067 | 696,993 | 305.60% | (468,926) |
| 540 | SANTA CRUZ COUNTY - Detention | 158,487 | 209,128 | 132.00% | (50,641) |
| 545 | NAVAJO COUNTY - Detention | 125,274 | 389,340 | 310.80% | (264,066) |
| 550 | YAVAPAI COUNTY - Detention | 608,096 | 1,265,039 | 208.00% | (656,943) |
| 555 | PINAL COUNTY - Dispatchers | 42,329 | 169,374 | 400.10% | (127,045) |
| 556 | TOWN OF ORO VALLEY - Dispatchers | 50,808 | 69,668 | 137.10% | (18,860) |
| 557 | TOWN OF MARANA - Dispatchers | 48,981 | 47,803 | 97.60% | 1,178 |
| 558 | GILA COUNTY - Dispatchers | 46,657 | 97,782 | 209.60% | (51,125) |
| 559 | TOWN OF WICKENBURG - Dispatchers | 18,270 | 43,318 | 237.10% | (25,048) |
| 560 | GRAHAM COUNTY - Dispatchers | 16,728 | 21,988 | 131.40% | (5,260) |
| 561 | YAVAPAI COUNTY - Dispatchers | 24,074 | 29,698 | 123.40% | (5,624) |
| 562 | CITY OF SOMERTON - Dispatchers | 26,211 | 24,092 | 91.90% | 2,119 |
| 563 | DEPARTMENT OF PUBLIC SAFETY - Dispatchers | 474,143 | 190,290 | 40.10% | 283,853 |
| 564 | DEPARTMENT OF PUBLIC SAFETY - Detention | 7,811 | 2,689 | 34.40% | 5,122 |
| 575 | ADMINISTRATIVE OFFICE OF THE COURTS | 15,945,022 | 11,039,565 | 69.20% | 4,905,457 |
| | TOTAL | $ 102,141,671 | $ 126,229,888 | | $ (24,088,217) |

# APPENDIX VI

## SUMMARY OF HEALTH CONTRIBUTION INFORMATION BY INDIVIDUAL EMPLOYERS

| Division Number | Employer Name | Health ER NC% | Health UAL Pmt % | Calculated ER Cont | Required ER Cont |
|---|---|---|---|---|---|
| 500 | DEPARTMENT OF CORRECTIONS - Detention | 0.27% | -0.27% | 0.00% | 0.00% |
| 501 | DEPT OF JUVENILE CORRECTIONS - Detention | 0.29% | -0.29% | 0.00% | 0.00% |
| 502 | PINAL COUNTY - Detention | 0.24% | -0.24% | 0.00% | 0.00% |
| 503 | GILA COUNTY - Detention | 0.34% | -0.34% | 0.00% | 0.00% |
| 504 | GRAHAM COUNTY - Detention | 0.23% | -0.12% | 0.11% | 0.11% |
| 505 | MARICOPA COUNTY - Detention | 0.21% | -0.21% | 0.00% | 0.00% |
| 506 | CITY OF AVONDALE - Detention | 0.19% | 0.06% | 0.25% | 0.25% |
| 507 | LA PAZ COUNTY - Detention | 0.20% | 0.42% | 0.62% | 0.62% |
| 510 | YUMA COUNTY - Detention | 0.21% | -0.21% | 0.00% | 0.00% |
| 515 | PIMA COUNTY - Detention | 0.21% | -0.21% | 0.00% | 0.00% |
| 520 | APACHE COUNTY - Detention | 0.30% | -0.30% | 0.00% | 0.00% |
| 525 | COCHISE COUNTY - Detention | 0.24% | -0.24% | 0.00% | 0.00% |
| 530 | COCONINO COUNTY - Detention | 0.19% | -0.16% | 0.03% | 0.03% |
| 535 | MOHAVE COUNTY - Detention | 0.28% | -0.28% | 0.00% | 0.00% |
| 540 | SANTA CRUZ COUNTY - Detention | 0.23% | -0.23% | 0.00% | 0.00% |
| 545 | NAVAJO COUNTY - Detention | 0.28% | -0.28% | 0.00% | 0.00% |
| 550 | YAVAPAI COUNTY - Detention | 0.23% | -0.23% | 0.00% | 0.00% |
| 555 | PINAL COUNTY - Dispatchers | 0.13% | -0.13% | 0.00% | 0.00% |
| 556 | TOWN OF ORO VALLEY - Dispatchers | 0.11% | -0.11% | 0.00% | 0.00% |
| 557 | TOWN OF MARANA - Dispatchers | 0.15% | 0.02% | 0.17% | 0.17% |
| 558 | GILA COUNTY - Dispatchers | 0.21% | -0.21% | 0.00% | 0.00% |
| 559 | TOWN OF WICKENBURG - Dispatchers | 0.28% | -0.28% | 0.00% | 0.00% |
| 560 | GRAHAM COUNTY - Dispatchers | 0.19% | -0.19% | 0.00% | 0.00% |
| 561 | YAVAPAI COUNTY - Dispatchers | 0.33% | -0.24% | 0.09% | 0.09% |
| 562 | CITY OF SOMERTON - Dispatchers | 0.20% | 0.10% | 0.30% | 0.30% |
| 563 | DEPARTMENT OF PUBLIC SAFETY - Dispatchers | 0.14% | 1.71% | 1.85% | 1.85% |
| 564 | DEPARTMENT OF PUBLIC SAFETY - Detention | 0.29% | 0.70% | 0.99% | 0.99% |
| 575 | ADMINISTRATIVE OFFICE OF THE COURTS | 0.21% | 0.32% | 0.53% | 0.53% |
| | TOTAL | 0.24% | -0.31% | 0.00% | 0.00% |

GRS Retirement Consulting
800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

December 14, 2018

Mr. Jared A. Smout, Administrator
Arizona Corrections Officer Retirement Plan (CORP)
3010 E. Camelback Road, Suite 200
Phoenix, Arizona 85016

**Re: Report of the June 30, 2018 Actuarial Valuation of CORP**

Dear Mr. Smout:

Enclosed please find five copies of this report.

Any questions or comments you may develop will be welcome.

Sincerely,

James D. Anderson

James D. Anderson, FSA, EA, FCA, MAAA

JDA:rmn
Enclosures



One Towne Square | Suite 800 | Southfield, Michigan 48076-3723