

Fresno County Employees' Retirement Association

**Actuarial Valuation and Review as of
June 30, 2017**



This report has been prepared at the request of the Board of Retirement to assist in administering the Fund. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Retirement and may only be provided to other parties in its entirety. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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December 7, 2017

*Board of Retirement
Fresno County Employees' Retirement Association
7772 N Palm Ave
Fresno, CA 93711*

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2017. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2018-2019 and analyzes the preceding year's experience.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Plan. The census information on which our calculations were based was prepared by FCERA and the financial information was provided by FCERA. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. 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); and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of Andy Yeung, ASA, EA, MAAA, FCA. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: 
Paul Angelo, FSA, EA, MAAA, FCA
Senior Vice President and Actuary


Andy Yeung, ASA, EA, MAAA, FCA
Vice President and Actuary

JAC/gxk

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SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Purpose

This report has been prepared by Segal Consulting to present a valuation of the Fresno County Employees' Retirement Association (FCERA) as of June 30, 2017. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of the Retirement Association, as administered by the Board;
- The characteristics of covered active members, inactive vested members, retired members and beneficiaries as of June 30, 2017, provided by FCERA;
- The assets of the Plan as of June 30, 2017, provided by FCERA;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

One of the general goals of an actuarial valuation is to establish contributions that fully fund the Association's liabilities, and that, as a percentage of payroll, remain as level as possible for each generation of active members. Annual actuarial valuations measure the progress toward this goal, as well as test the adequacy of the contribution rates.

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to evaluate the Association's assets, liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by the Association's staff. This information has not been audited by us, but it has been reviewed and found to be consistent, both internally and with prior year's information.

The contribution requirements are determined as a percentage of payroll. The Association's employer rates provide for both normal cost and a payment or credit to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have continued with the Board's funding policy to amortize the Association's outstanding balance of the unfunded actuarial accrued liability (UAAL) established as of June 30, 2003 over a declining period with 16 years remaining as of June 30, 2017. Any new UAAL established on each subsequent actuarial valuation after the June 30, 2003 valuation as a result of actuarial gains or losses, changes in actuarial assumptions or plan amendments¹ is amortized over separate 15-year declining period. A schedule of current amortization amounts may be found in Section 4, Appendix B. Note that a graphical projection of the UAAL amortization bases and payments has been included as a new Appendix C.

Reference: Pgs. 94 - 98

Reference: Pgs. 99 - 100

¹ Prior to the Board's most recent review of actuarial funding policy in April 2011, a 30-year amortization period was used for plan amendments.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

The Actuarial Standards Board's Actuarial Standard of Practice (ASOP) No. 4 provides guidelines that actuaries have to follow when selecting actuarial assumptions. For a plan such as that offered by the Retirement Association that may utilize excess earnings to provide contribution rate offsets and additional settlement and non-statutory benefits, we are required to indicate in the valuation report that the possible impact of any such application of future excess earnings on the future financial condition of the plan has not been explicitly measured in the valuation.²

The rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2018 through June 30, 2019.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

- | | | |
|-------------------|----------------|---|
| <i>Reference:</i> | <i>Pg. 47</i> | ➤ In this June 30, 2017 valuation, the UAAL has decreased from \$1,194.1 million to \$1,113.9 million when determined on a valuation (smoothed) value of assets basis. On a market value basis, the UAAL decreased from \$1,462.8 million to \$1,236.2 million. The funded ratio on a valuation value of assets basis has increased from 78.2% to 80.3%, while on a market value basis, the funded ratio has increased from 73.3% to 78.1%. A reconciliation of the Association's unfunded actuarial accrued liability is provided in Section 3, Exhibit H. |
| <i>Reference:</i> | <i>Pg. 19</i> | ➤ Before considering the three-year employer contribution rate phase-in, the aggregate employer rate calculated in this valuation has decreased from 56.01% of payroll to 55.93% of payroll. The reasons for this decrease are: (i) continuing active salary increases less than expected, (ii) lower than expected COLA increases, and (iii) other experience gains, offset to some degree by (iv) lower than expected return on investments (based on valuation value of assets after smoothing), (v) actual contributions less than expected, and (vi) increase in UAAL rate due to lower than expected increase in total payroll. A reconciliation of the Association's aggregate employer rate is provided in Section 2, Subsection D, Chart 15. |
| <i>Reference:</i> | <i>Pg. 102</i> | ➤ Last year, the Board approved a three-year phase-in of the employer cost impact due to the changes in actuarial assumptions from the June 30, 2016 valuation and the aggregate employer rate was 52.33% after the phase-in. This is the second year of the phase-in. The aggregate employer contribution rate after reflecting the phase-in is 54.09% and is shown in Appendix E and Appendix F of this report. All results shown in this valuation report other than Appendix E and Appendix F <u>exclude</u> the effect of the phase-in. |

² Under the Board's interest crediting policy, the balance of \$912.6 million (negative) in the Contra Tracking Account has to be fully restored before any excess earnings can be utilized in the future to provide any of the above offsets and benefits.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

- Reference:* Pg. 20 ➤ The aggregate member rate calculated in this valuation has decreased from 9.51% of payroll to 9.47% of payroll. The change in the aggregate member rate is due to changes in the demographics of the active membership. A reconciliation of the Association's aggregate member rate is provided in Section 2, Subsection D, see Chart 16.
- Reference:* Pg. 46 ➤ As of the June 30, 2017 valuation, the Board approved the closing of the Survivor Death Benefit Reserve (valuation reserve) which had a deficit balance and transferred that balance to the Current Service Pension Reserve. It is our understanding that all Survivor Death Benefit Reserve benefit payments since January 2017 have been paid from the Current Service Pension Reserve. The Board also approved the transfer of the negative balance in the Retiree Health Benefit Reserve (BOR) to the Contra Tracking Account.
- Reference:* Pg. 5 ➤ As indicated in Section 2, Subsection B, Chart 7 of this report, the net total unrecognized investment losses as of June 30, 2017 are \$122.3 million compared to the net total unrecognized investment losses of \$268.7 million as of June 30, 2016. These investment losses will be recognized in the determination of the valuation value of assets for funding purposes in the next few years, and will offset any investment gains that may occur after June 30, 2017. If the Association earns the assumed net rate of investment return of 7.00% per year on a **market value** basis, that will result in investment losses on the valuation value of assets in the next few years. This means that, if the actual market return is equal to the assumed 7.00% rate and all other actuarial assumptions are met, the contribution requirements would increase in the next few years.
- Reference:* Pgs. 9 - 10 ➤ The current unrecognized investment losses represent about 2.8% of the market value of assets. Unless offset by future investments gains or other favorable experience, the recognition of the \$122.3 million in past market losses is expected to have an impact on the Association's future funded ratio and the aggregate employer contributions. This potential impact may be illustrated as follows:
- If the deferred losses were recognized immediately in the valuation value of assets, the funded percentage would decrease from 80.3% to 78.1%.

For comparison purposes, if all the deferred losses in the June 30, 2016 valuation had been recognized immediately in the June 30, 2016 valuation, the funded percentage would have decreased from 78.2% to 73.3%.
 - If the deferred losses were recognized immediately in the actuarial value of assets, the aggregate employer contribution rate would increase from 55.9% of payroll to 58.5% of payroll.

For comparison purposes, if all the deferred losses in the June 30, 2016 valuation had been recognized immediately in the June 30, 2016 valuation, the aggregate employer contribution rate would have increased from 56.7% of payroll to 62.5% of payroll.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Reference: Pg. 71

- In preparing the breakdown of the total costs of the General Tier 1 plan into the cost to provide the “Regular” and the “Settlement” benefits, we have followed the FCERA practice of allocating the cost to provide a benefit under Section 31676.12 as the cost for the “Regular” benefit and allocating the difference between this “Regular” benefit cost and the cost to provide a benefit under Section 31676.14 plus Section 31627 as the “Settlement” benefit. In particular, this means that the difference between benefits under Sections 31676.12 and 31676.14 is considered “Settlement” and so under the Settlement Agreement could be funded out of future undistributed earnings. Based on discussions with Counsel, the Agreement might not be clear as to what should be considered the “Settlement” benefit. We will require guidance from the Board if and when the Board and Counsel consider the use of any future undistributed earnings to pay the cost of the “Settlement” benefit.
- The actuarial valuation report as of June 30, 2017 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected. Declines in asset values will increase the actuarial cost of the plan, while increases will decrease the actuarial cost of the plan.

Impact of Future Experience on Contribution Rates

Future contribution requirements may differ from those determined in the valuation because of:

- 1) differences between actual experience and anticipated experience;
- 2) changes in actuarial assumptions or methods;
- 3) changes in statutory provisions; and
- 4) difference between the contribution rates determined by the valuation and those adopted by the Board.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Summary of Key Valuation Results

	June 30, 2017		June 30, 2016	
Employer Contribution Rates:		Estimated		Estimated
	Total Rate	Annual Amount ⁽¹⁾	Total Rate	Annual Amount ⁽¹⁾
General Tier 1	56.32%	\$110,772,000	56.56%	\$111,244,000
General Tier 2	53.52%	4,919,000	53.52%	4,919,000
General Tier 3	53.11%	17,498,000	53.06%	17,482,000
General Tier 4	44.03%	6,068,000	43.95%	6,057,000
General Tier 5	42.42%	39,113,000	42.45%	39,141,000
Safety Tier 1	81.75%	36,544,000	81.63%	36,490,000
Safety Tier 2	81.86%	3,787,000	81.80%	3,784,000
Safety Tier 4	66.59%	2,696,000	66.15%	2,679,000
Safety Tier 5	64.23%	10,003,000	63.99%	9,966,000
All categories combined	55.93%	231,400,000	56.01%	231,762,000
Average Member Contribution Rates:		Estimated		Estimated
	Total Rate	Annual Amount ⁽¹⁾	Total Rate	Annual Amount ⁽¹⁾
General Tier 1	9.93%	\$19,531,000	9.99%	\$19,649,000
General Tier 2	7.22%	664,000	7.26%	667,000
General Tier 3	7.99%	2,632,000	8.00%	2,636,000
General Tier 4	7.06%	973,000	7.11%	980,000
General Tier 5	7.23%	6,666,000	7.26%	6,694,000
Safety Tier 1	13.18%	5,892,000	13.21%	5,905,000
Safety Tier 2	11.61%	537,000	11.59%	536,000
Safety Tier 4	10.09%	409,000	10.06%	407,000
Safety Tier 5	12.07%	1,880,000	12.03%	1,874,000
All categories combined	9.47%	39,184,000	9.51%	39,348,000
Funded Status:				
Actuarial accrued liability ⁽²⁾	\$5,643,444,000		\$5,472,149,000	
Valuation value of assets (VVA) ⁽³⁾	4,529,508,000		4,278,001,000	
Market value of assets (MVA) ⁽³⁾	4,407,222,000		4,009,337,000	
Funded percentage on a VVA basis	80.3%		78.2%	
Funded percentage on a MVA basis	78.1%		73.3%	
Unfunded actuarial accrued liability on a VVA basis	\$1,113,936,000		\$1,194,148,000	
Unfunded actuarial accrued liability on a MVA basis	1,236,222,000		1,462,812,000	
Key Economic Assumptions:				
Interest rate	7.00%		7.00%	
Inflation rate	3.00%		3.00%	
Across-the-board salary increase	0.50%		0.50%	

⁽¹⁾ Based on June 30, 2017 projected annual compensation.

⁽²⁾ Excludes liabilities for non-vested supplemental benefits.

⁽³⁾ Excludes non-valuation reserves: contingency reserve, supplemental COLA and retiree health benefit reserve (BOR), if any.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Summary of Key Valuation Demographic and Financial Data

	June 30, 2017	June 30, 2016	Change From Prior Year
Active Members:			
Number of members	7,353	7,297	0.8%
Average age	43.0	43.2	-0.2
Average service	10.4	10.5	-0.1
Projected total compensation	\$413,760,698	\$402,534,551	2.8%
Average projected compensation	56,271	55,164	2.0%
Retired Member and Beneficiaries:			
Number of members:			
Service retired	5,902	5,781	2.1%
Disability retired	377	368	2.4%
Beneficiaries	921	883	4.3%
Total	7,200	7,032	2.4%
Average age	69.4	69.2	0.2
Average monthly benefit ⁽¹⁾	\$2,919	\$2,855	2.2%
Vested Terminated Members:			
Number of vested terminated members ⁽²⁾	3,411	3,289	3.7%
Average age	45.1	45.4	-0.3
Summary of Financial Data:			
Market value of assets ⁽³⁾	\$4,407,221,766	\$4,009,495,932	9.9%
Return on market value of assets	10.44%	-0.11%	N/A
Actuarial value of assets ⁽³⁾	\$4,529,508,479	\$4,278,160,681	5.9%
Return on actuarial value of assets	6.35%	4.97%	N/A
Valuation value of assets	\$4,529,508,479	\$4,278,001,313	5.9%
Return on valuation value of assets	6.36%	4.97%	N/A

(1) Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

(2) Includes members who left their contributions on deposit with less than five years of service.

(3) Includes non-valuation reserves: contingency reserve, supplemental COLA and retiree health benefit reserve (BOR), if any.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Important Information about Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare an actuarial valuation, Segal Consulting (“Segal”) relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan description in this report to confirm that Segal has correctly interpreted the plan provisions.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by FCERA. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** This valuation is based on the market value of assets as of the valuation date, as provided by FCERA.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal’s actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The valuation is prepared at the request of the FCERA. Segal is not responsible for the use or misuse of its report, particularly by any other party.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- If FCERA is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of FCERA, it is not a fiduciary in its capacity as actuaries and consultants with respect to FCERA.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

A. MEMBER DATA

The actuarial valuation and review considers the number and demographic characteristics of covered members, including active members, vested terminated members, retired members and beneficiaries.

This section presents a summary of significant statistical data on these member groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A, B, and C.

A historical perspective of how the member population has changed over the past ten valuations can be seen in this chart.

CHART 1

Member Population: 2008 – 2017

Year Ended June 30	Active Members	Vested Terminated Members	Retired Members and Beneficiaries	Ratio of Non-Actives to Actives
2008	7,740	1,541	5,046	0.85
2009	7,407	1,460	5,322	0.92
2010	6,946	1,452	5,636	1.02
2011	6,763	1,414	5,887	1.08
2012	6,677	1,375	6,235	1.14
2013	6,866	1,295	6,363	1.12
2014	6,968	1,380	6,570	1.14
2015	7,001	3,163 ⁽¹⁾	6,839	1.43
2016	7,297	3,289	7,032	1.41
2017	7,353	3,411	7,200	1.44

⁽¹⁾ Effective June 30, 2015, includes terminated members under age 70 only due a refund of member contributions.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 7,353 active members with an average age of 43.0 years, average years of service of 10.4 and average compensation of \$56,271. The 7,297 active members in the prior valuation had an average age of 43.2 years, average years of service of 10.5 and average compensation of \$55,164.

Inactive Members

In this year's valuation, there were 3,411 members with a vested right to a deferred or immediate vested benefit or entitled to a return of their member contributions versus 3,289 in the prior valuation.

These graphs show a distribution of active members by age and by years of service.

CHART 2

Distribution of Active Members by Age as of June 30, 2017

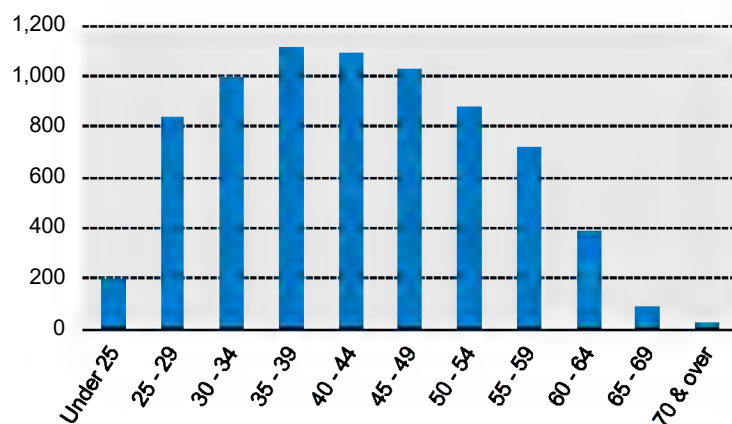
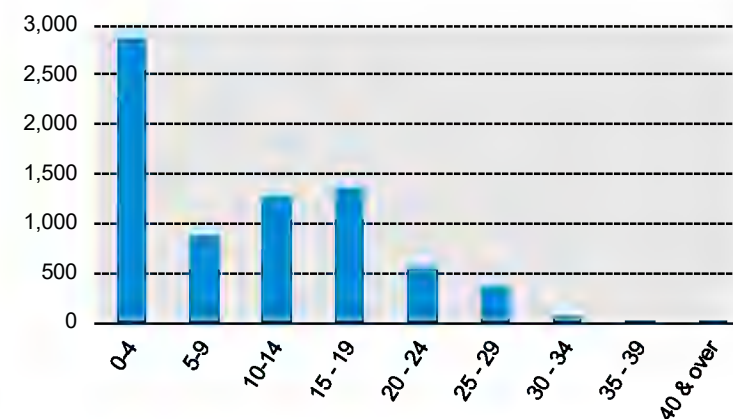


CHART 3

Distribution of Active Members by Years of Service as of June 30, 2017



SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

Retired Members and Beneficiaries

As of June 30, 2017, 6,279 retired members and 921 beneficiaries were receiving total monthly benefits of \$21,013,868. For comparison, in the previous valuation, there were 6,149 retired members and 883 beneficiaries receiving monthly benefits of \$20,076,722. These monthly benefits exclude non-vested supplemental benefits (i.e., discretionary supplemental COLA and additional health benefits), if any.

These graphs show a distribution of the current retired members based on their monthly amount and age, by type of pension.

CHART 4

Distribution of Retired Members (Excl. Beneficiaries) by Type and by Monthly Amount as of June 30, 2017

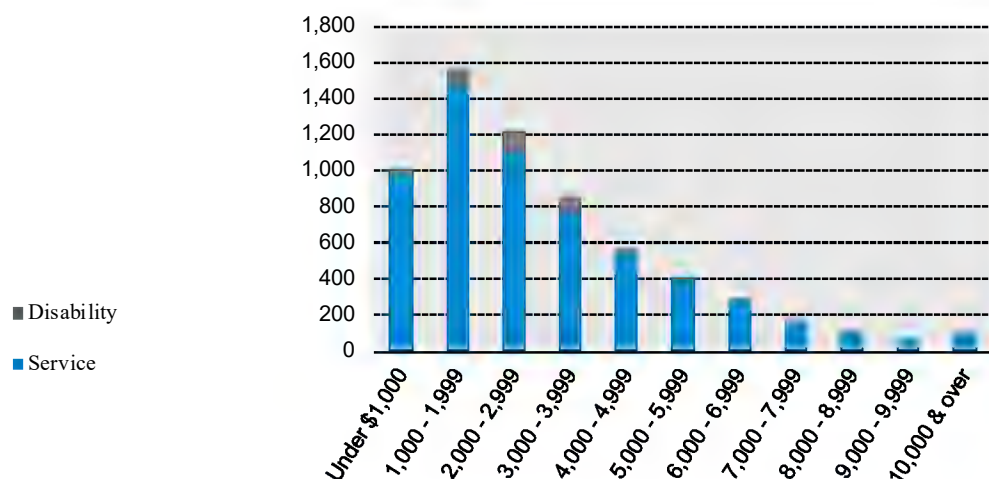
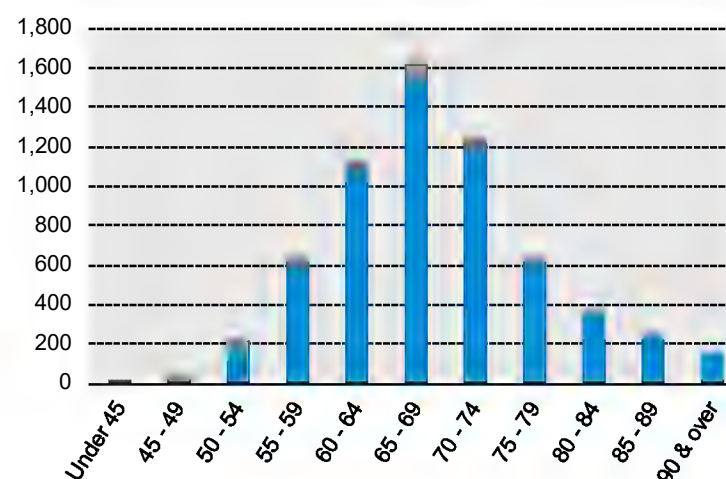


CHART 5

Distribution of Retired Members (Excl. Beneficiaries) by Type and by Age as of June 30, 2017



SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

B. FINANCIAL INFORMATION

Retirement plan funding anticipates that, over the long term, both contributions and net investment earnings (less investment fees and administrative expenses) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. The adjustment toward market value shown in the chart is the “non-cash” earnings on investments implicitly included in the actuarial value of assets. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits D and E.

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board of Retirement has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

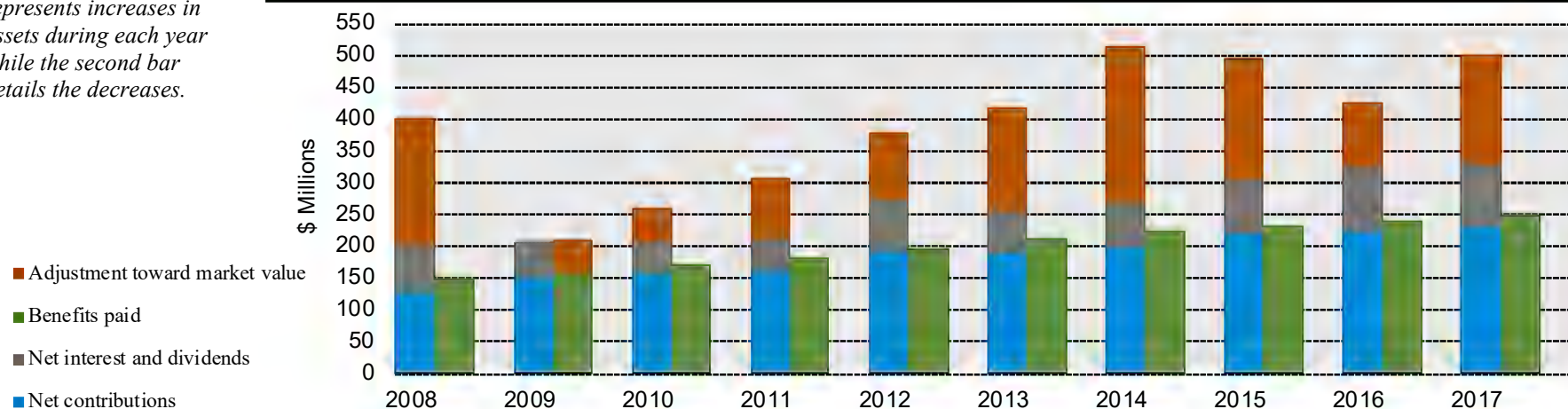
The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value of assets.

The determination of the Actuarial Value of Assets is provided on the following page.

The chart depicts the components of changes in the actuarial value of assets over the last ten years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.

CHART 6

Comparison of Increases and Decreases in the Actuarial Value of Assets for Years Ended June 30, 2008 through 2017



SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

CHART 7

Determination of Actuarial Value of Assets for Year Ended June 30, 2017

Six Month Period		Total Actual Market Return (net)	Expected Market Return (net) ⁽¹⁾	Investment Gain (Loss)	Deferred Factor	Deferred Return
From	To					
1/1/2013	6/30/2013	\$134,122,546	\$130,563,210	\$3,559,336	0.1	\$355,934
7/1/2013	12/31/2013	395,606,395	135,374,319	260,232,075	0.2	52,046,415
1/1/2014	6/30/2014	184,000,262	150,143,559	33,856,703	0.3	10,157,011
7/1/2014	12/31/2014	(49,012,922)	146,717,748	(195,730,670)	0.4	(78,292,268)
1/1/2015	6/30/2015	45,076,629	144,685,951	(99,609,322)	0.5	(49,804,661)
7/1/2015	12/31/2015	(150,074,689)	146,021,073	(296,095,762)	0.6	(177,657,457)
1/1/2016	6/30/2016	145,755,632	140,249,099	5,506,533	0.7	3,854,573
7/1/2016	12/31/2016	92,367,225	145,213,925	(52,846,700)	0.8	(42,277,360)
1/1/2017	6/30/2017	325,236,505	148,201,950	177,034,556	0.9	159,331,100
1. Total Deferred Return ⁽²⁾						\$(122,286,713)
2. Net Market Value						4,407,221,766
3. Actuarial Value of Assets (Item 2 – Item 1)						4,529,508,479
4. Actuarial Value (before corridor) as a percentage of Market Value						102.8%
5. Actuarial Value of Assets – Corridor Limits:						
a. Lower Limit – 70% of Net Market Value						\$3,085,055,236
b. Upper Limit – 130% of Net Market Value						5,729,388,296
6. Actuarial Value of Assets (within corridor)						4,529,508,479
7. Non-valuation reserves and designations:						
a. Reserve for Interest Fluctuations (Contingency Reserve), Limited to No Less Than \$0						\$0
b. Board Contingency Reserve/Undistributed Earnings (“Available Earnings”)						0
c. Supplemental COLA						0
d. Retiree Health Benefit (BOR), Limited to No Less Than \$0						0
e. Subtotal						\$0
8. Valuation Value of Assets (Item 6 – Item 7e)						\$4,529,508,479

⁽¹⁾ The expected market return has been calculated by FCERA using an investment return assumption consistent with that used in the applicable actuarial valuation to set the employer and employee contribution rates for that period.

⁽²⁾ The amounts of deferred return that will be recognized in each subsequent valuation are as follows:

6/30/2018	\$(33,174,584)
6/30/2019	(88,962,603)
6/30/2020	(43,241,207)
6/30/2021	25,388,224
6/30/2022	17,703,456
Total	\$(122,286,713)

Note: Results may not total properly due to rounding.

The chart shows the determination of the actuarial value of assets as of the valuation date.

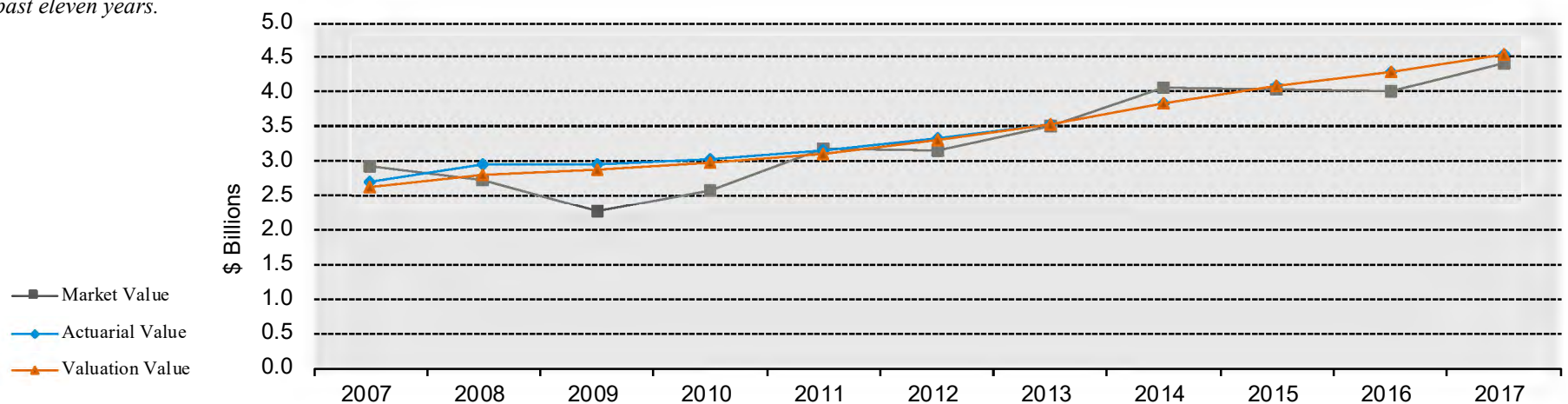
SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

The market value, actuarial value, and valuation value of assets are representations of the FCERA's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets, but with less volatility. The valuation value of assets is the actuarial value, excluding any non-valuation reserves. The valuation asset value is significant because FCERA's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

This chart shows the change in market value, actuarial value and valuation value over the past eleven years.

CHART 8

Market Value, Actuarial Value and Valuation Value of Assets as of June 30, 2007 – 2017



SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

C. ACTUARIAL EXPERIENCE

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total experience gain was \$9.6 million, including a loss of \$27.4 million from investments and a gain of \$37.0 million from all other sources. The net experience variation from individual sources other than investments was 0.7% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

CHART 9

Actuarial Experience for Year Ended June 30, 2017

1. Net loss from investments ⁽¹⁾	\$(27,432,000)
2. Net gain from other experience ⁽²⁾	<u>37,011,000</u>
3. Net experience gain: (1) + (2)	<u>\$9,579,000</u>

⁽¹⁾ Details in Chart 10.

⁽²⁾ See Section 3, Items 7(b) through 7(e) in Exhibit H.

This chart provides a summary of the actuarial experience during the past year.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

Investment Rate of Return

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on FCERA's investment policy. For valuation purposes, the assumed rate of return was 7.00% (based on the June 30, 2016 valuation). The actual rate of return on a valuation basis for the 2016/2017 plan year was 6.36%.

Since the actual return for the year was less than the assumed return, FCERA experienced an actuarial loss during the year ended June 30, 2017 with regard to its investments.

This chart shows the gain/(loss) due to investment experience.

CHART 10

Investment Experience for Year Ended June 30, 2017 – Market, Actuarial and Valuation Value of Assets

	Market Value	Actuarial Value	Valuation Value
1. Actual return	\$417,603,730	\$271,225,694	\$271,333,784
2. Average value of assets	3,999,556,984	4,268,221,733	4,268,088,004
3. Actual rate of return: (1) ÷ (2)	10.44%	6.35%	6.36%
4. Assumed rate of return	7.00%	7.00%	7.00%
5. Expected return: (2) x (4)	279,968,989	298,775,521	298,766,160
6. Actuarial gain/(loss): (1) – (5)	<u>\$137,634,741</u>	<u>\$(27,549,827)</u>	<u>\$(27,432,376)</u>

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on a market, actuarial, and valuation basis for the last ten years.

CHART 11

Investment Return – Market Value, Actuarial Value and Valuation Value: 2008 – 2017

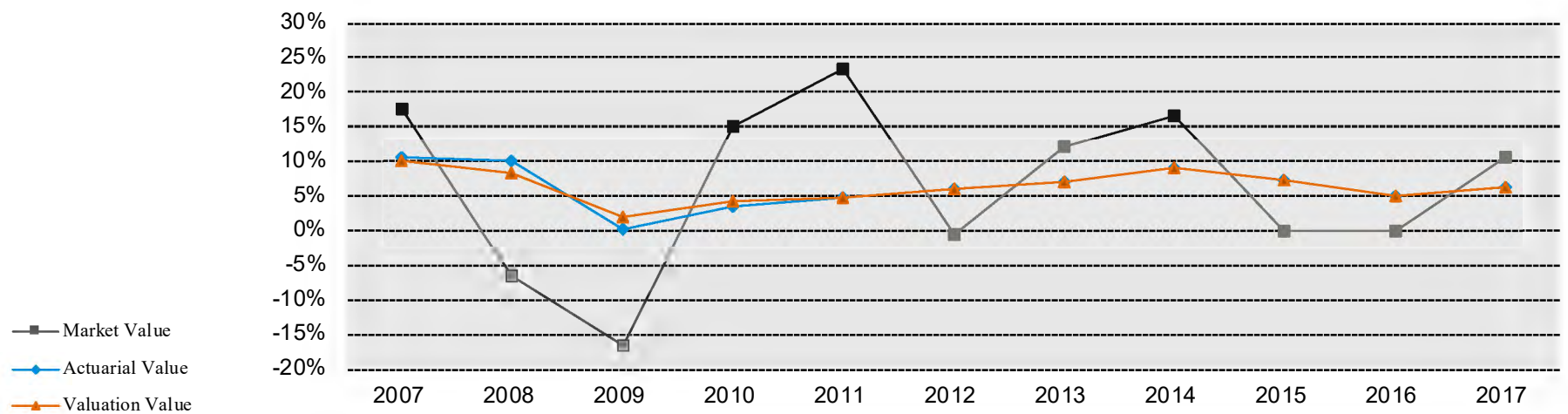
Year Ended June 30	Market Value Investment Return		Actuarial Value Investment Return		Valuation Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent
2008	\$(190,479,656)	(6.51%)	\$271,876,171	10.14%	\$212,997,330	8.17%
2009	(455,354,552)	(16.73%)	6,924,705	0.24%	54,209,327	1.93%
2010	337,869,234	14.98%	100,789,315	3.44%	123,408,438	4.31%
2011	601,313,325	23.34%	144,184,272	4.78%	144,184,273	4.84%
2012	(13,839,384)	(0.44%)	187,138,723	5.94%	187,137,138	6.01%
2013	374,807,596	11.95%	229,380,360	6.91%	229,380,360	6.96%
2014	579,606,657	16.63%	318,423,932	9.03%	315,164,400	8.98%
2015	(3,936,293)	(0.10%)	278,588,356	7.29%	279,206,627	7.31%
2016	(4,319,056)	(0.11%)	203,088,149	4.97%	203,089,850	4.97%
2017	417,603,730	10.44%	271,225,694	6.35%	271,333,784	6.36%
Five-Year Average Return		7.55%		6.90%		6.91%
Ten-Year Average Return		4.69%		5.88%		5.97%

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

CHART 12

Market, Actuarial and Valuation Rates of Return for Years Ended June 30, 2007 – 2017



SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- actual turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements,
- salary increases different than assumed, and
- COLA increases from retirees different than assumed.

The net gain from this other experience for the year ended June 30, 2017 amounted to \$37.0 million which is 0.7% of the actuarial accrued liability. See Exhibit H for a detailed development of the unfunded actuarial accrued liability.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

D. EMPLOYER AND MEMBER CONTRIBUTIONS

Employer contributions consist of two components:

Normal Cost

The annual contribution rate that, if paid annually from a member's first year of membership through the year of retirement, would accumulate to the amount necessary to fully fund the member's retirement-related benefits. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution rate is expressed as a level percentage of the member's compensation.

Contribution to the Unfunded Actuarial Accrued Liability (UAAL)

The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution (or rate credit in the case of a negative UAAL) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the Association) assuming a constant number of active members. In order to remain as a level percentage of payroll, amortization payments (credits) are scheduled to increase at the annual rate of 3.50% (i.e., 3.00% inflation plus 0.50% real across-the-board salary increase). The UAAL established as of the June 30, 2003 valuation is being amortized over a declining period with 16 years remaining as of June 30, 2017. Any new UAAL established on each subsequent valuation after June 30, 2003 as a result of actuarial gains or losses, changes in actuarial assumptions or plan amendments⁽¹⁾ are amortized over separate 15-year declining periods.

The recommended employer contributions are provided on Chart 13.

All employer contribution rates shown in this report other than Appendix E and Appendix F are before reflecting the three-year phase-in of the effect of the changes in actuarial assumptions from the June 30, 2016 valuation.

⁽¹⁾ Prior to the Board's most recent review of actuarial funding policy in April 2011, a 30-year amortization period was used for plan amendments.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

Member Contributions

Non-CalPEPRA Members

Articles 6 and 6.8 of the 1937 Act define the methodology to be used in the calculation of member basic contribution rates for General members and Safety members, respectively.

The basic contribution rate for the Regular benefit is determined so that the accumulation of a member's basic contributions made in a given year until a certain age will be sufficient to fund an annuity at that age that is equal to:

- 1/200 of One-Year Average Final Compensation at age 60 for General Tier 1
- 1/240 of One-Year Average Final Compensation at age 60 for General Tier 2
- 1/200 of Three-Year Average Final Compensation at age 55 for General Tier 3
- 1/120 of Three-Year Average Final Compensation at age 60 for General Tier 4
- 1/200 of One-Year Average Final Compensation at age 50 for Safety Tiers 1 and 2
- 1/100 of Three-Year Average Final Compensation at age 50 for Safety Tier 4

In addition, as a result of the Settlement Agreement, General Tier 1 and Safety Tier 1 members are required to make additional basic contributions in order to receive the Settlement Benefit. The total basic Regular plus Settlement rate is:

- 1/160 of One-Year Average Final Compensation at age 55 for General Tier 1
- 1/160 of One-Year Average Final Compensation at age 50 for Safety Tier 1

It is assumed that contributions are made annually at the same rate, starting at entry age. In addition to their basic contributions, members in Tiers 1, 2 and 3 pay one-half of the total normal cost necessary to fund their cost-of-living benefits. There are no cost-of-living benefits provided in General and Safety Tiers 4. Accumulation includes semi-annual crediting of interest at the assumed investment earning rate.

CalPEPRA Members

Pursuant to Section 7522.30(a) of the Government Code, CalPEPRA members in General and Safety Tiers 5 are required to contribute at least 50% of the Normal Cost rate. In addition, there are certain additional requirements that would have to be met such as requiring the new employees to pay the contribution rate of "similarly situated employees", if it is greater. (reference: Section 7522.30(c)). We further understand

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

that different rules may have to be applied for collectively bargained employees, non-represented, managerial or other supervisory employees. (reference: Section 7522.30(e)). In preparing the Normal Cost rates in this report, we have assumed that exactly 50% of the Normal Cost would be paid by the new members and we have taken into account in this valuation only the requirements of Section 7522.30(c), but not requirements of Section 7522.30(e).

The member contribution rates are provided in Appendix A.

Administrative Expense

The Board adopted an explicit administrative expense assumption of 1.10% of payroll effective with the June 30, 2014 valuation. At the last review of the Economic Actuarial Assumptions Report as of June 30, 2016, the Board acted to continue the same administrative expense assumption of 1.10% of payroll.

This explicit administrative expense is allocated to both the employer and member based on the components of the total average contribution rate (before expenses) for the employer and member. This results in an administrative expense load shown in the following table:

	<u>Average Contribution Rates Before Administrative Expense</u>	<u>Weighting</u>	<u>Total Loading</u>
Employer	54.99%	85.52%	0.94%
Member	9.31%	<u>14.48%</u>	<u>0.16%</u>
		100.00%	1.10%

Under this approach, the employer Normal Cost rate is then increased by the same percent of payroll as the member rate with the remaining employer loading allocated to the employer UAAL rate. The administrative expense load has been added to the Regular rates. The table below shows this allocation.

<u>Allocation of Administrative Expense Load as % of Payroll</u>	
Addition to Employer Basic Normal Cost Rate	0.16%
Addition to Employer Basic UAAL Rate	0.78%
Addition to Member Basic Rate	<u>0.16%</u>
Total Addition to Contribution Rates	1.10%

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

CHART 13

Recommended Employer Contribution Rates (Dollar Amounts in Thousands)

	June 30, 2017 ⁽¹⁾						June 30, 2016 ⁽¹⁾	
	REGULAR		SETTLEMENT		TOTAL		REGULAR & SETTLEMENT	
	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
General Tier 1 Members								
Normal Cost	16.07%	\$31,607	5.06%	\$9,952	21.13%	\$41,559	21.37%	\$42,031
UAAL	30.02%	59,044	5.17%	10,169	35.19%	69,213	35.19%	69,213
Total Contribution	46.09%	\$90,651	10.23%	\$20,121	56.32%	\$110,772	56.56%	\$111,244
General Tier 2 Members								
Normal Cost	18.07%	\$1,661	0.26%	\$24	18.33%	\$1,685	18.33%	\$1,685
UAAL	30.02%	2,758	5.17%	476	35.19%	3,234	35.19%	3,234
Total Contribution	48.09%	\$4,419	5.43%	\$500	53.52%	\$4,919	53.52%	\$4,919
General Tier 3 Members								
Normal Cost	17.60%	\$5,799	0.32%	\$105	17.92%	\$5,904	17.87%	\$5,888
UAAL	30.02%	9,891	5.17%	1,703	35.19%	11,594	35.19%	11,594
Total Contribution	47.62%	\$15,690	5.49%	\$1,808	53.11%	\$17,498	53.06%	\$17,482
General Tier 4 Members								
Normal Cost	8.84%	\$1,218	0.00%	\$0	8.84%	\$1,218	8.76%	\$1,207
UAAL	30.02%	4,138	5.17%	712	35.19%	4,850	35.19%	4,850
Total Contribution	38.86%	\$5,356	5.17%	\$712	44.03%	\$6,068	43.95%	\$6,057
General Tier 5 Members								
Normal Cost	7.23%	\$6,666	0.00%	\$0	7.23%	\$6,666	7.26%	\$6,694
UAAL	30.02%	27,680	5.17%	4,767	35.19%	32,447	35.19%	32,447
Total Contribution	37.25%	\$34,346	5.17%	\$4,767	42.42%	\$39,113	42.45%	\$39,141

⁽¹⁾ The Regular Normal Cost and UAAL rates shown for each cost group include an explicit administrative expense of 0.16% and 0.78% of payroll, respectively.

⁽²⁾ Amounts are in thousands and are based on June 30, 2017 projected annual compensation shown on the following page.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

CHART 13 (continued)

Recommended Employer Contribution Rates (Dollar Amounts in Thousands)

	June 30, 2017 ⁽¹⁾						June 30, 2016 ⁽¹⁾	
	REGULAR		SETTLEMENT		TOTAL		REGULAR & SETTLEMENT	
	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Safety Tier 1 Members								
Normal Cost	23.84%	\$10,656	5.75%	\$2,571	29.59%	\$13,227	29.67%	\$13,263
UAAL	45.61%	20,389	6.55%	2,928	52.16%	23,317	51.96%	23,227
Total Contribution	69.45%	\$31,045	12.30%	\$5,499	81.75%	\$36,544	81.63%	\$36,490
Safety Tier 2 Members								
Normal Cost	29.45%	\$1,362	0.25%	\$12	29.70%	\$1,374	29.84%	\$1,380
UAAL	45.61%	2,110	6.55%	303	52.16%	2,413	51.96%	2,404
Total Contribution	75.06%	\$3,472	6.80%	\$315	81.86%	\$3,787	81.80%	\$3,784
Safety Tier 4 Members								
Normal Cost	14.23%	\$576	0.20%	\$8	14.43%	\$584	14.19%	\$575
UAAL	45.61%	1,847	6.55%	265	52.16%	2,112	51.96%	2,104
Total Contribution	59.84%	\$2,423	6.75%	\$273	66.59%	\$2,696	66.15%	\$2,679
Safety Tier 5 Members								
Normal Cost	12.07%	\$1,880	0.00%	\$0	12.07%	\$1,880	12.03%	\$1,874
UAAL	45.61%	7,103	6.55%	1,020	52.16%	8,123	51.96%	8,092
Total Contribution	57.68%	\$8,983	6.55%	\$1,020	64.23%	\$10,003	63.99%	\$9,966
All Categories Combined								
Normal Cost	14.85%	\$61,425	3.06%	\$12,672	17.91%	\$74,097	18.03%	\$74,597
UAAL	32.62%	134,960	5.40%	22,343	38.02%	157,303	37.98%	157,165
Total Contribution	47.47%	\$196,385	8.46%	\$35,015	55.93%	\$231,400	56.01%	\$231,762

⁽¹⁾ The Regular Normal Cost and UAAL rates shown for each cost group include an explicit administrative expense of 0.16% and 0.78% of payroll, respectively.

⁽²⁾ Amounts are in thousands and are based on June 30, 2017 projected annual compensation (also in thousands):

General Tier 1	\$196,683	Safety Tier 1	\$44,702
General Tier 2	9,191	Safety Tier 2	4,626
General Tier 3	32,947		
General Tier 4	13,782	Safety Tier 4	4,049
General Tier 5	92,206	Safety Tier 5	15,574
Total Compensation		\$413,760	

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

CHART 14

Breakdown of Employer Contribution Rate Into Basic and COLA

	General									
	June 30, 2017					June 30, 2016				
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Normal Cost										
Regular - Basic	12.67%	14.68%	14.08%	8.68%	7.07%	12.81%	14.70%	14.06%	8.60%	7.10%
Regular - COLA	3.24%	3.23%	3.36%	0.00%	0.00%	3.28%	3.22%	3.33%	0.00%	0.00%
Section 6	4.68%	0.00%	0.00%	0.00%	0.00%	4.73%	0.00%	0.00%	0.00%	0.00%
Section 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Section 9	0.38%	0.26%	0.32%	0.00%	0.00%	0.39%	0.25%	0.32%	0.00%	0.00%
Administrative Expense	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
Subtotal	21.13%	18.33%	17.92%	8.84%	7.23%	21.37%	18.33%	17.87%	8.76%	7.26%
UAAL										
Regular – Basic	19.01%	19.01%	19.01%	19.01%	19.01%	18.75%	18.75%	18.75%	18.75%	18.75%
Regular – COLA	10.23%	10.23%	10.23%	10.23%	10.23%	10.30%	10.30%	10.30%	10.30%	10.30%
Section 6	4.20%	4.20%	4.20%	4.20%	4.20%	4.39%	4.39%	4.39%	4.39%	4.39%
Section 8	-0.03%	-0.03%	-0.03%	-0.03%	-0.03%	0.06%	0.06%	0.06%	0.06%	0.06%
Section 9	1.00%	1.00%	1.00%	1.00%	1.00%	0.91%	0.91%	0.91%	0.91%	0.91%
Administrative Expense	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%
Subtotal	35.19%	35.19%	35.19%	35.19%	35.19%	35.19%	35.19%	35.19%	35.19%	35.19%
Total	56.32%	53.52%	53.11%	44.03%	42.42%	56.56%	53.52%	53.06%	43.95%	42.45%

Note: Please refer to Section 4, Exhibit III for definition of Regular and Settlement Sections 6, 8 and 9 benefits.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

CHART 14 (continued)

Breakdown of Employer Contribution Rate Into Basic and COLA

	Safety							
	June 30, 2017				June 30, 2016			
	Tier 1	Tier 2	Tier 4	Tier 5	Tier 1	Tier 2	Tier 4	Tier 5
Normal Cost								
Regular - Basic	18.71%	23.18%	14.07%	11.91%	18.73%	23.27%	13.84%	11.87%
Regular - COLA	4.97%	6.11%	0.00%	0.00%	5.02%	6.16%	0.00%	0.00%
Section 6	5.43%	0.00%	0.00%	0.00%	5.43%	0.00%	0.00%	0.00%
Section 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Section 9	0.32%	0.25%	0.20%	0.00%	0.33%	0.25%	0.19%	0.00%
Administrative Expense	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
Subtotal	29.59%	29.70%	14.43%	12.07%	29.67%	29.84%	14.19%	12.03%
UAAL								
Regular – Basic	20.92%	20.92%	20.92%	20.92%	20.99%	20.99%	20.99%	20.99%
Regular – COLA	23.91%	23.91%	23.91%	23.91%	23.61%	23.61%	23.61%	23.61%
Section 6	5.58%	5.58%	5.58%	5.58%	5.61%	5.61%	5.61%	5.61%
Section 8	-0.03%	-0.03%	-0.03%	-0.03%	0.06%	0.06%	0.06%	0.06%
Section 9	1.00%	1.00%	1.00%	1.00%	0.91%	0.91%	0.91%	0.91%
Administrative Expense	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%
Subtotal	52.16%	52.16%	52.16%	52.16%	51.96%	51.96%	51.96%	51.96%
Total	81.75%	81.86%	66.59%	64.23%	81.63%	81.80%	66.15%	63.99%

Note: Please refer to Section 4, Exhibit III for definition of Regular and Settlement Sections 6, 8 and 9 benefits.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

The employer contribution rates as of June 30, 2017 are based on all of the data described in the previous sections, the actuarial assumptions described in Section 4, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

Reconciliation of Recommended Employer Contribution

The chart below details the changes in the recommended employer contribution from the prior valuation to the current year's valuation, prior to the phase-in of the contribution rate impact of the 2016 assumption changes.

CHART 15

Reconciliation of Recommended Employer Contribution from June 30, 2016 to June 30, 2017 (Dollars in Thousands)

	Contribution Rate	Estimated Amount ⁽¹⁾
Recommended Contribution Rate as of June 30, 2016 (before phase-in)	56.01%	\$231,762
Effect of actuarial experience during 2016/2017:		
1. Effect of investment loss on valuation value of assets ⁽²⁾	0.57%	\$2,358
2. Effect of actual contributions less than expected ⁽³⁾	0.70%	2,896
3. Effect of salary increases less than expected during 2016/2017	-0.35%	-1,448
4. Effect of increase in UAAL rate due to lower than expected increase in total payroll	0.26%	1,076
5. Effect of COLA increases less than expected	-0.95%	-3,931
6. Effect of other experience gains ⁽⁴⁾	<u>-0.31%</u>	<u>-1,313</u>
Subtotal	-0.08%	-\$362
Recommended Contribution Rate as of June 30, 2017 (before phase-in)	55.93%	\$231,400

⁽¹⁾ Based on June 30, 2017 projected annual compensation of \$413,760.

⁽²⁾ Return on valuation value of assets of 6.36% was less than the 7.00% assumed rate of return.

⁽³⁾ Contribution loss from one-year delay in implementing higher contribution rates recommended in June 30, 2016 valuation.

⁽⁴⁾ Includes a reduction in normal cost of 0.12% from change in active member demographics.

The chart reconciles the employer contribution from the prior valuation to the amount determined in this valuation.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

The member contribution rates as of June 30, 2017 are based on all of the data described in the previous sections, the actuarial assumptions described in Section 4, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

Reconciliation of Recommended Member Contribution Rate

The chart below details the changes in the recommended member contribution rate from the prior valuation to the current year's valuation.

CHART 16

Reconciliation of Recommended Member Contribution from June 30, 2016 to June 30, 2017 (Dollar Amounts in Thousands)

	Contribution Rate	Estimated Amount ⁽¹⁾
Average Contribution Rate as of June 30, 2016	9.51%	\$39,348
Effect of actuarial experience during 2016/2017:		
1. Effect of change in active member demographics	-0.04%	-\$164
Subtotal	-0.04%	-\$164
Average Contribution Rate as of June 30, 2017	9.47%	\$39,184

⁽¹⁾ Based on June 30, 2017 projected annual compensation of \$413,760.

The chart reconciles the member contribution from the prior valuation to the amount determined in this valuation.

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

E. FUNDED RATIO

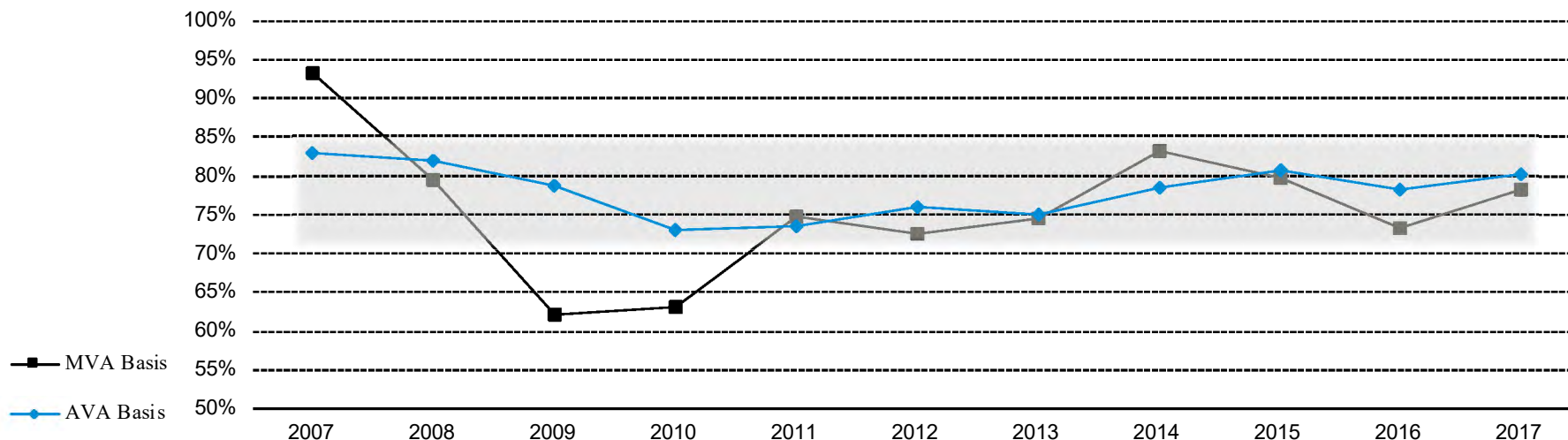
A commonly reported piece of information regarding the Plan's financial status is the funded ratio. These ratios compare the valuation value of assets and market value of assets to the actuarial accrued liabilities of the Plan as calculated. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors. The chart below depicts a history of the funded

ratio for this plan. Chart 18 on the next page shows the Plan's schedule of funding progress for the last ten years.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. As the chart below shows, the measures are different depending on whether the valuation or market value of assets is used.

CHART 17

Funded Ratio for Plan Years Ending June 30, 2007 - 2017



SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

CHART 18

Schedule of Funding Progress (Dollar Amounts in Thousands)

Actuarial Valuation Date	Valuation Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (a) – (b)	Funded Ratio (%) (a) / (b)	Projected Covered Payroll (c)	UAAL as a Percentage of Projected Covered Payroll (%) [(a) – (b)] / (c)
6/30/2008	\$2,812,423	\$3,429,990	\$617,567	82.0	\$424,083	145.6
6/30/2009	2,864,956	3,644,743	779,787	78.6	422,519	184.6
6/30/2010	2,983,044	4,092,464	1,109,420	72.9	408,861	271.3
6/30/2011	3,114,483	4,237,961	1,123,478	73.5	398,976	281.6
6/30/2012	3,305,045	4,345,402	1,040,357	76.1	365,596	284.6
6/30/2013	3,518,982	4,694,780	1,175,798	75.0	370,079	317.7
6/30/2014	3,824,221	4,876,754	1,052,533	78.4	373,774	281.6
6/30/2015	4,092,647	5,074,333	981,686	80.7	383,775	255.8
6/30/2016	4,278,001	5,472,149	1,194,148	78.2	402,535	296.7
6/30/2017	4,529,508	5,643,444	1,113,936	80.3	413,760	269.2

SECTION 2: Valuation Results for the Fresno County Employees' Retirement Association

F. VOLATILITY RATIOS

Retirement plans are subject to volatility in the level of required contributions. This volatility tends to increase as retirement plans become more mature.

The Asset Volatility Ratio (AVR), which is equal to the market value of assets divided by total payroll, provides an indication of the potential contribution volatility for any given level of investment volatility. A higher AVR indicates that the plan is subject to a greater level of contribution volatility. This is a current measure since it is based on the current level of assets.

For FCERA, the current AVR is 10.7. This means that a 1% asset gain/(loss) (relative to the assumed investment return) translates to 10.7% of one-year's payroll. Since FCERA amortizes actuarial gains and losses over a period of 15 years as of June 30, 2017, there would be a 0.9% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

The Liability Volatility Ratio (LVR), which is equal to the Actuarial Accrued Liability divided by payroll, provides an indication of the longer-term potential for contribution volatility for any given level of investment volatility. This is because, over an extended period of time, the plan's assets should track the plan's liabilities. For example, if a plan is 50% funded on a market value basis, the liability volatility ratio would be double the asset volatility ratio and the plan sponsor should expect contribution volatility to increase over time as the plan becomes better funded.

The LVR also indicates how volatile contributions will be in response to changes in the Actuarial Accrued Liability due to actual experience or to changes in actuarial assumptions.

For FCERA, the current LVR is about 13.6. This is about 27% higher than the AVR. Therefore, we would expect that contribution volatility will increase over the long-term.

CHART 19

Volatility Ratios for Years Ended June 30, 2009 – 2017

Year Ended June 30	Asset Volatility Ratios			Liability Volatility Ratios		
	General	Safety	Total	General	Safety	Total
2009	5.2	6.0	5.4	8.3	10.2	8.6
2010	6.1	7.4	6.3	9.6	12.3	10.0
2011	7.6	9.9	7.9	10.1	13.6	10.6
2012	8.3	10.4	8.6	11.3	14.9	11.9
2013	9.1	11.2	9.5	12.1	15.6	12.7
2014	10.4	13.0	10.8	12.4	16.1	13.0
2015	10.0	13.1	10.5	12.5	16.8	13.2
2016	9.5	12.0	10.0	12.9	16.8	13.6
2017	10.2	13.0	10.7	13.0	17.0	13.6

This chart shows how the asset and liability volatility ratios have varied over time.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

i. General Tier 1

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	3,147	3,420	-8.0%
Average age	49.0	48.5	0.5
Average service	17.1	16.4	0.7
Projected total compensation	\$196,683,398	\$206,629,037	-4.8%
Projected average compensation	\$62,499	\$60,418	3.4%
Member account balances	\$212,044,475	\$212,695,411	-0.3%
Vested terminated members			
Number	2,033	2,088	-2.6%
Average age	49.1	48.8	0.3
Retired members			
Number in pay status	5,240	5,147	1.8%
Average age	69.9	69.6	0.3
Average monthly benefit ⁽¹⁾	\$2,930	\$2,851	2.8%
Disabled members			
Number in pay status	208	205	1.5%
Average age	66.4	66.6	-0.2
Average monthly benefit ⁽¹⁾	\$1,998	\$1,973	1.3%
Beneficiaries			
Number in pay status	738	716	3.1%
Average age	72.3	72.2	0.1
Average monthly benefit ⁽¹⁾	\$1,721	\$1,695	1.5%

⁽¹⁾ Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

ii. General Tier 2

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	127	136	-6.6%
Average age	45.4	44.4	1.0
Average service	8.2	7.2	1.0
Projected total compensation	\$9,190,782	\$9,597,613	-4.2%
Projected average compensation	\$72,368	\$70,571	2.5%
Member account balances	\$4,124,463	\$3,746,879	10.1%
Vested terminated members			
Number	118	118	0.0%
Average age	44.2	43.9	0.3
Retired members			
Number in pay status	17	16	6.3%
Average age	64.5	63.1	1.4
Average monthly benefit ⁽¹⁾	\$1,985	\$2,038	-2.6%
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A

⁽¹⁾ Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

iii. General Tier 3

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	669	734	-8.9%
Average age	42.3	41.6	0.7
Average service	8.2	7.2	1.0
Projected total compensation	\$32,946,840	\$34,682,256	-5.0%
Projected average compensation	\$49,248	\$47,251	4.2%
Member account balances	\$15,634,918	\$14,609,357	7.0%
Vested terminated members			
Number	253	240	5.4%
Average age	40.7	40.3	0.4
Retired members			
Number in pay status	19	11	72.7%
Average age	64.1	60.9	3.2
Average monthly benefit ^{(1),(2)}	\$1,184	\$4,535	-73.9%
Disabled members			
Number in pay status	4	2	100.0%
Average age	52.8	57.5	-4.7
Average monthly benefit ⁽¹⁾	\$1,454	\$1,272	14.3%
Beneficiaries			
Number in pay status	5	2	150.0%
Average age	54.1	61.9	-7.8
Average monthly benefit ⁽¹⁾	\$1,026	\$1,105	-7.1%

⁽¹⁾ Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

⁽²⁾ Includes effect of benefit correction for one retiree record.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

iv. General Tier 4

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	275	293	-6.1%
Average age	42.0	40.8	1.2
Average service	4.0	3.2	0.8
Projected total compensation	\$13,782,376	\$14,008,426	-1.6%
Projected average compensation	\$50,118	\$47,810	4.8%
Member account balances	\$3,107,694	\$2,440,685	27.3%
Vested terminated members			
Number	121	115	5.2%
Average age	40.5	39.3	1.2
Retired members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A

⁽¹⁾ Benefits include regular benefits but exclude non-vested supplemental benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

v. General Tier 5

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	2,203	1,794	22.8%
Average age	35.9	35.6	0.3
Average service	1.9	1.4	0.5
Projected total compensation	\$92,205,924	\$70,898,131	30.1%
Projected average compensation	\$41,855	\$39,520	5.9%
Member account balances	\$10,524,010	\$6,145,706	71.2%
Vested terminated members			
Number	580	436	33.0%
Average age	35.6	35.5	0.1
Retired members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A

⁽¹⁾ Benefits include regular benefits but exclude non-vested supplemental benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

vi. Safety Tier 1

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	526	563	-6.6%
Average age	46.0	45.4	0.6
Average service	18.2	17.5	0.7
Projected total compensation	\$44,701,770	\$46,192,292	-3.2%
Projected average compensation	\$84,984	\$82,047	3.6%
Member account balances	\$61,859,609	\$60,691,297	1.9%
Vested terminated members			
Number	209	212	-1.4%
Average age	47.2	46.5	0.7
Retired members			
Number in pay status	626	607	3.1%
Average age	66.4	66.1	0.3
Average monthly benefit ⁽¹⁾	\$4,711	\$4,633	1.7%
Disabled members			
Number in pay status	165	161	2.5%
Average age	59.9	59.3	0.6
Average monthly benefit ⁽¹⁾	\$3,415	\$3,332	2.5%
Beneficiaries			
Number in pay status	178	165	7.9%
Average age	66.0	67.0	-1.0
Average monthly benefit ⁽¹⁾	\$2,225	\$2,129	4.5%

⁽¹⁾ Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

vii. Safety Tier 2

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	62	63	-1.6%
Average age	37.7	36.8	0.9
Average service	7.9	6.9	1.0
Projected total compensation	\$4,626,143	\$4,485,732	3.1%
Projected average compensation	\$74,615	\$71,202	4.8%
Member account balances	\$3,171,951	\$2,665,051	19.0%
Vested terminated members			
Number	22	23	-4.3%
Average age	35.2	35.8	-0.6
Retired members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A

⁽¹⁾ Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

viii. Safety Tier 4

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	61	61	0.0%
Average age	34.6	33.3	1.3
Average service	4.3	3.3	1.0
Projected total compensation	\$4,049,227	\$3,818,542	6.0%
Projected average compensation	\$66,381	\$62,599	6.0%
Member account balances	\$1,350,757	\$981,346	37.6%
Vested terminated members			
Number	17	19	-10.5%
Average age	35.8	35.1	0.7
Retired members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A

⁽¹⁾ Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT A

Table of Plan Coverage

ix. Safety Tier 5

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	283	233	21.5%
Average age	30.5	29.9	0.6
Average service	1.9	1.4	0.5
Projected total compensation	\$15,574,238	\$12,222,522	27.4%
Projected average compensation	\$55,033	\$52,457	4.9%
Member account balances	\$3,101,382	\$1,760,623	76.2%
Vested terminated members			
Number	58	38	52.6%
Average age	30.7	30.3	0.4
Retired members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽¹⁾	N/A	N/A	N/A

⁽¹⁾ Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

i. General Tier 1

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	9	2	6	1	--	--	--	--	--	--
	\$42,116	\$47,303	\$41,023	\$38,303	--	--	--	--	--	--
30 - 34	110	4	46	60	--	--	--	--	--	--
	52,050	41,390	49,674	54,582	--	--	--	--	--	--
35 - 39	429	3	47	274	105	--	--	--	--	--
	59,069	51,732	56,159	60,140	\$57,787	--	--	--	--	--
40 - 44	569	3	31	203	306	26	--	--	--	--
	62,003	48,231	67,727	60,890	61,939	\$66,220	--	--	--	--
45 - 49	626	3	30	144	279	136	34	--	--	--
	64,757	39,985	59,582	63,333	64,841	68,997	\$59,883	--	--	--
50 - 54	556	1	6	124	178	122	115	9	1	--
	64,758	54,635	50,150	62,257	61,655	69,100	68,698	\$63,135	\$56,733	--
55 - 59	500	--	19	88	152	85	116	30	10	--
	64,548	--	64,100	57,183	61,462	63,880	71,447	77,884	62,764	--
60 - 64	275	--	12	55	96	58	37	6	11	--
	60,433	--	47,457	57,883	59,769	64,489	57,917	97,332	60,083	--
65 - 69	57	2	2	15	22	6	5	2	2	1
	63,776	40,311	28,979	70,984	58,399	75,177	77,885	54,992	60,471	\$75,696
70 & over	16	--	--	5	5	2	3	--	--	1
	55,403	--	--	53,831	67,975	35,280	49,385	--	--	58,708
Total	3,147	18	199	969	1,143	435	310	47	24	2
	\$62,499	\$45,293	\$56,301	\$60,415	\$61,935	\$67,189	\$67,434	\$76,568	\$61,093	\$67,202

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

ii. General Tier 2

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	4	--	4	--	--	--	--	--	--	--
	\$58,259	--	\$58,259	--	--	--	--	--	--	--
30 - 34	17	1	15	1	--	--	--	--	--	--
	62,845	\$57,290	63,798	\$54,103	--	--	--	--	--	--
35 - 39	28	--	22	6	--	--	--	--	--	--
	69,194	--	64,621	85,964	--	--	--	--	--	--
40 - 44	23	1	16	5	1	--	--	--	--	--
	81,353	224,009	70,285	88,871	\$78,190	--	--	--	--	--
45 - 49	13	--	10	3	--	--	--	--	--	--
	69,316	--	67,482	75,427	--	--	--	--	--	--
50 - 54	15	1	9	5	--	--	--	--	--	--
	75,426	38,549	87,571	60,942	--	--	--	--	--	--
55 - 59	12	--	10	1	1	--	--	--	--	--
	67,367	--	71,533	44,666	48,408	--	--	--	--	--
60 - 64	7	--	6	1	--	--	--	--	--	--
	95,111	--	102,302	51,968	--	--	--	--	--	--
65 - 69	5	--	2	3	--	--	--	--	--	--
	64,403	--	56,928	69,386	--	--	--	--	--	--
70 & over	3	--	1	2	--	--	--	--	--	--
	84,040	--	154,564	48,778	--	--	--	--	--	--
Total	127	3	95	27	2	--	--	--	--	--
	\$72,368	\$106,616	\$71,545	\$72,133	\$63,299	--	--	--	--	--

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

iii. General Tier 3

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	22	5	16	1	--	--	--	--	--	--
	\$40,144	\$29,342	\$43,561	\$39,480	--	--	--	--	--	--
30 - 34	162	13	125	24	--	--	--	--	--	--
	48,064	38,773	48,961	48,426	--	--	--	--	--	--
35 - 39	163	10	121	30	2	--	--	--	--	--
	50,670	42,720	50,503	54,280	\$46,378	--	--	--	--	--
40 - 44	92	5	66	16	5	--	--	--	--	--
	53,039	46,456	52,107	59,689	50,644	--	--	--	--	--
45 - 49	78	7	50	14	7	--	--	--	--	--
	50,128	34,379	51,050	52,861	53,830	--	--	--	--	--
50 - 54	60	3	41	11	4	1	--	--	--	--
	46,581	33,554	45,571	51,836	46,388	\$70,019	--	--	--	--
55 - 59	55	4	40	4	7	--	--	--	--	--
	46,945	47,410	46,780	57,369	41,665	--	--	--	--	--
60 - 64	25	--	21	2	2	--	--	--	--	--
	50,249	--	49,607	63,563	43,668	--	--	--	--	--
65 - 69	11	1	7	3	--	--	--	--	--	--
	51,454	33,851	54,498	50,220	--	--	--	--	--	--
70 & over	1	1	--	--	--	--	--	--	--	--
	29,438	29,438	--	--	--	--	--	--	--	--
Total	669	49	487	105	27	1	--	--	--	--
	\$49,248	\$38,867	\$49,450	\$53,359	\$47,679	\$70,019	--	--	--	--

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

iv. General Tier 4

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	25	25	--	--	--	--	--	--	--	--
	\$45,547	\$45,547	--	--	--	--	--	--	--	--
30 - 34	67	57	10	--	--	--	--	--	--	--
	51,971	51,900	\$52,372	--	--	--	--	--	--	--
35 - 39	47	39	6	2	--	--	--	--	--	--
	55,410	54,467	60,761	\$57,739	--	--	--	--	--	--
40 - 44	38	36	2	--	--	--	--	--	--	--
	47,117	46,796	52,902	--	--	--	--	--	--	--
45 - 49	31	26	5	--	--	--	--	--	--	--
	46,607	45,615	51,767	--	--	--	--	--	--	--
50 - 54	23	22	1	--	--	--	--	--	--	--
	45,340	44,273	68,813	--	--	--	--	--	--	--
55 - 59	26	25	1	--	--	--	--	--	--	--
	56,859	55,491	91,061	--	--	--	--	--	--	--
60 - 64	15	15	--	--	--	--	--	--	--	--
	39,578	39,578	--	--	--	--	--	--	--	--
65 - 69	3	2	1	--	--	--	--	--	--	--
	69,097	83,243	40,806	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	275	247	26	2	--	--	--	--	--	--
	\$50,118	\$49,447	\$55,908	\$57,739	--	--	--	--	--	--

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

v. General Tier 5

Age	Total	Years of Service								
		0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	155	155	--	--	--	--	--	--	--	--
	\$35,340	\$35,340	--	--	--	--	--	--	--	--
25 - 29	622	622	--	--	--	--	--	--	--	--
	41,282	41,282	--	--	--	--	--	--	--	--
30 - 34	518	518	--	--	--	--	--	--	--	--
	42,823	42,823	--	--	--	--	--	--	--	--
35 - 39	316	316	--	--	--	--	--	--	--	--
	41,901	41,901	--	--	--	--	--	--	--	--
40 - 44	196	195	--	1	--	--	--	--	--	--
	43,276	43,290	--	\$40,494	--	--	--	--	--	--
45 - 49	131	131	--	--	--	--	--	--	--	--
	43,683	43,683	--	--	--	--	--	--	--	--
50 - 54	111	111	--	--	--	--	--	--	--	--
	42,523	42,523	--	--	--	--	--	--	--	--
55 - 59	90	90	--	--	--	--	--	--	--	--
	42,773	42,773	--	--	--	--	--	--	--	--
60 - 64	53	53	--	--	--	--	--	--	--	--
	43,426	43,426	--	--	--	--	--	--	--	--
65 - 69	9	9	--	--	--	--	--	--	--	--
	52,917	52,917	--	--	--	--	--	--	--	--
70 & over	2	2	--	--	--	--	--	--	--	--
	38,116	38,116	--	--	--	--	--	--	--	--
Total	2,203	2,202	--	1 ⁽¹⁾	--	--	--	--	--	--
	\$41,855	\$41,855	--	\$40,494	--	--	--	--	--	--

⁽¹⁾ This member has prior service with General Tier 1.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

vi. Safety Tier 1

Age	Total	Years of Service								
		0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
30 - 34	13	--	1	12	--	--	--	--	--	--
	\$76,296	--	\$60,260	\$77,632	--	--	--	--	--	--
35 - 39	83	1	2	66	14	--	--	--	--	--
	81,070	\$73,780	68,801	80,002	\$88,376	--	--	--	--	--
40 - 44	148	1	2	44	83	18	--	--	--	--
	85,353	62,929	73,431	81,123	86,507	\$92,941	--	--	--	--
45 - 49	138	--	2	23	53	48	12	--	--	--
	85,557	--	72,131	79,814	84,766	87,927	\$92,811	--	--	--
50 - 54	105	--	2	8	23	29	38	5	--	--
	85,978	--	68,228	74,224	82,434	84,877	89,803	\$105,503	--	--
55 - 59	28	--	--	3	8	6	11	--	--	--
	86,011	--	--	81,434	80,582	89,748	89,170	--	--	--
60 - 64	8	--	--	1	2	4	--	1	--	--
	94,323	--	--	70,810	79,052	86,339	--	180,311	--	--
65 - 69	3	--	--	1	--	--	1	--	--	1
	117,149	--	--	90,967	--	--	121,504	--	--	\$138,975
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	526	2	9	158	183	105	62	6	--	1
	\$84,984	\$68,355	\$69,493	\$79,853	\$85,294	\$87,988	\$90,784	\$117,971	--	\$138,975

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

vii. Safety Tier 2

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	9	2	7	--	--	--	--	--	--	--
	\$65,875	\$62,407	\$66,866	--	--	--	--	--	--	--
30 - 34	23	1	16	6	--	--	--	--	--	--
	76,226	50,347	73,925	\$86,675	--	--	--	--	--	--
35 - 39	12	1	5	6	--	--	--	--	--	--
	76,672	65,635	75,442	79,536	--	--	--	--	--	--
40 - 44	8	1	7	--	--	--	--	--	--	--
	66,611	69,884	66,144	--	--	--	--	--	--	--
45 - 49	4	--	3	1	--	--	--	--	--	--
	76,910	--	77,467	75,237	--	--	--	--	--	--
50 - 54	2	--	2	--	--	--	--	--	--	--
	84,229	--	84,229	--	--	--	--	--	--	--
55 - 59	2	--	2	--	--	--	--	--	--	--
	91,618	--	91,618	--	--	--	--	--	--	--
60 - 64	2	--	2	--	--	--	--	--	--	--
	83,895	--	83,895	--	--	--	--	--	--	--
65 - 69	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	62	5	44	13	--	--	--	--	--	--
	\$74,615	\$62,136	\$73,704	\$82,500	--	--	--	--	--	--

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

viii. Safety Tier 4

Age	Total	Years of Service								
		0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	15	15	--	--	--	--	--	--	--	--
	\$64,485	\$64,485	--	--	--	--	--	--	--	--
30 - 34	25	25	--	--	--	--	--	--	--	--
	65,726	65,726	--	--	--	--	--	--	--	--
35 - 39	13	12	1	--	--	--	--	--	--	--
	68,784	69,119	\$64,760	--	--	--	--	--	--	--
40 - 44	2	1	1	--	--	--	--	--	--	--
	55,164	49,906	60,421	--	--	--	--	--	--	--
45 - 49	4	3	1	--	--	--	--	--	--	--
	67,739	71,290	57,089	--	--	--	--	--	--	--
50 - 54	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
55 - 59	2	2	--	--	--	--	--	--	--	--
	81,665	81,665	--	--	--	--	--	--	--	--
60 - 64	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
65 - 69	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	61	58	3	--	--	--	--	--	--	--
	\$66,381	\$66,672	\$60,757	--	--	--	--	--	--	--

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT B

**Members in Active Service and Projected Average Compensation
By Age, Years of Service as of June 30, 2017**

ix. Safety Tier 5

Age	Total	Years of Service								
		0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	45	45	--	--	--	--	--	--	--	--
	\$52,012	\$52,012	--	--	--	--	--	--	--	--
25 - 29	131	131	--	--	--	--	--	--	--	--
	53,814	53,814	--	--	--	--	--	--	--	--
30 - 34	60	60	--	--	--	--	--	--	--	--
	53,947	53,947	--	--	--	--	--	--	--	--
35 - 39	22	22	--	--	--	--	--	--	--	--
	58,052	58,052	--	--	--	--	--	--	--	--
40 - 44	12	12	--	--	--	--	--	--	--	--
	62,666	62,666	--	--	--	--	--	--	--	--
45 - 49	4	4	--	--	--	--	--	--	--	--
	63,749	63,749	--	--	--	--	--	--	--	--
50 - 54	2	2	--	--	--	--	--	--	--	--
	56,929	56,929	--	--	--	--	--	--	--	--
55 - 59	5	5	--	--	--	--	--	--	--	--
	84,444	84,444	--	--	--	--	--	--	--	--
60 - 64	1	1	--	--	--	--	--	--	--	--
	64,075	64,075	--	--	--	--	--	--	--	--
65 - 69	1	1	--	--	--	--	--	--	--	--
	63,004	63,004	--	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	283	283	--	--	--	--	--	--	--	--
	\$55,033	\$55,033	--	--	--	--	--	--	--	--

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT C

Reconciliation of Member Data – June 30, 2016 to June 30, 2017

	Active Members	Vested Terminated Members	Pensioners	Disableds	Beneficiaries	Total
Number as of June 30, 2016	7,297	3,289	5,781	368	883	17,618
New members	716	69	0	0	0	785
Terminations – with vested rights	-321	321	0	0	0	0
Contributions refunds	-156	-151	0	0	0	-307
Retirements	-206	-70	276	0	0	0
New disabilities	-7	-4	-7	18	0	0
Return to work	39	-38	-1	0	0	0
Died with or without beneficiary	-9	-5	-147	-10	38 ⁽¹⁾	-133
Data adjustments	0	0	0	1	0	1
Number as of June 30, 2017	7,353	3,411	5,902	377	921	17,964

⁽¹⁾ This is the net increase of beneficiaries after subtracting the number of beneficiaries who died during the year.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT D

Summary Statement of Income and Expenses on an Actuarial Value Basis

	Year Ended June 30	
	2017	2016
Net Contribution income:		
Employer contributions	\$198,472,119	\$191,529,239
Employee contributions	36,259,132	35,211,756
Less administrative fees ⁽¹⁾	<u>(4,762,253)</u>	<u>(4,814,003)</u>
Contribution income	\$229,968,998	\$221,926,993
Investment income:		
Interest, dividends and other income	\$123,092,805	\$118,571,398
Adjustment toward market value	172,740,991	102,282,748
Less investment fees	<u>(24,608,102)</u>	<u>(17,765,997)</u>
Net investment income	<u>271,225,694</u>	<u>203,088,149</u>
Total income available for benefits	\$501,194,692	\$425,015,142
Less benefit payments:		
Service retirement	\$(240,682,559)	\$(231,686,871)
Death payments	(1,825,296)	(1,295,185)
Supplemental cost of living	(50,589)	(570,220)
Members refunds	(2,697,597)	(2,203,568)
Health benefit subsidies	<u>(4,590,854)</u>	<u>(4,475,511)</u>
Benefit payments	\$(249,846,894)	\$(240,231,354)
Change in reserve for future benefits	\$251,347,798	\$184,783,788

⁽¹⁾ Prior to 2016, administrative expenses were shown as an offset to investment income in this exhibit.

Results may not total properly due to rounding.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT E

Summary Statement of Assets

	Year Ended June 30,	
	2017	2016
Cash equivalents	\$316,810,768	\$94,681,304
Accounts receivable:		
Investment trades	\$13,015,679	\$26,812,274
Interest and dividends	14,001,270	13,077,363
Contributions and others	7,955,833	7,050,992
Securities lending	<u>62,429</u>	<u>132,945</u>
Total accounts receivable	35,035,210	47,073,575
Investments:		
Equities	\$1,617,057,383	\$1,506,843,998
Fixed income	1,431,909,981	1,631,199,875
Real estate	18,007,552	21,438,571
Securities lending collateral	37,941,129	200,177,900
Capital assets	10,792,330	10,379,124
Others	<u>993,014,722</u>	<u>730,659,584</u>
Total investments at market value	<u>4,108,723,098</u>	<u>4,100,699,052</u>
Total assets	\$4,460,569,076	\$4,242,453,931
Less accounts payable:		
Investment trades	\$(12,248,753)	\$(28,988,706)
Cash collateral payable for securities lending	(37,941,129)	(200,177,900)
Securities lending bank and broker fees	(19,117)	(31,913)
Others	<u>(3,138,311)</u>	<u>(3,759,480)</u>
Total accounts payable	\$(53,347,310)	\$(232,957,999)
Net assets at market value	<u>\$4,407,221,766</u>	<u>\$4,009,495,932</u>
Net assets at actuarial value	<u>\$4,529,508,479</u>	<u>\$4,278,160,681</u>
Net assets at valuation value	<u>\$4,529,508,479</u>	<u>\$4,278,001,313</u>

Results may not total properly due to rounding.

EXHIBIT F

Actuarial Balance Sheet

An overview of the Plan’s funding is given by an Actuarial Balance Sheet. In this approach, we first determine the amount and timing of all future payments that will be made by the Plan for current participants. We then discount these payments at the valuation interest rate to the date of the valuation, thereby determining their present value. We refer to this present value as the “liability” of the Plan.

Second, we determine how this liability will be met. These actuarial “assets” include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer normal cost contributions, and the present value of future employer payments to amortize the UAAL.

Actuarial Balance Sheet (Dollar Amounts in Thousands)

		Settlement Benefits			
Assets	<u>Regular⁽¹⁾</u>	<u>Section 6⁽¹⁾</u>	<u>Section 8⁽¹⁾</u>	<u>Section 9⁽¹⁾</u>	<u>Total</u>
1. Total valuation assets	\$3,572,202	\$852,663	\$83,900	\$20,743	\$4,529,508
2. Present value of future contributions by members	279,943	44,648	0	0	324,591
3. Present value of future employer contributions for:					
a. entry age normal cost	465,020	73,617	0	6,454	545,091
b. unfunded actuarial accrued liability	869,214	195,582	(1,264)	50,404	1,113,936
4. Total current and future assets	\$5,186,379	\$1,166,510	\$82,636	\$77,601	\$6,513,126
Liabilities					
5. Present value of benefits already accrued	\$2,711,493	\$614,661	\$82,636	\$49,368	\$3,458,158
6. Present value of benefits to be accrued - deferred members	227,971	74,990	0	3,498	306,459
- active members	2,246,915	476,859	0	24,735	2,748,509
7. Total liabilities	\$5,186,379	\$1,166,510	\$82,636	\$77,601	\$6,513,126

⁽¹⁾ Please refer to Section 4, Exhibit III for definition of Regular and Settlement Sections 6, 8 and 9 benefits.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT G

Summary of Reported Asset Information as of June 30, 2017

	Reserves
Used in Development of Valuation Value of Assets	
<i>Regular Valuation Reserves</i>	
Members' Accumulated Contributions	\$407,251,625
Current Service Reserve	1,218,377,579
Annuity Pension Reserve	127,687,896
Current Service Pension Reserve	1,290,411,595
Cost of Living Reserve	1,240,280,280
Subtotal	\$4,284,008,975
<i>Settlement Reserves (Section 6)</i>	
Supplemental Annuity Reserve	\$648,704,990
Members' Accumulated Contributions	53,412,134
Current Service Reserve	279,844,471
Annuity Pension Reserve	32,740,710
Subtotal	\$1,014,702,305
<i>Settlement Benefit Reserve (Section 8)</i>	\$110,315,198
<i>Retiree Health Benefit Reserve (Section 9)</i>	\$33,068,230
<i>Contra Tracking Account</i>	\$(912,586,229)
<i>Valuation Value of Assets</i>	\$4,529,508,479
Not Used in Development of Valuation Value of Assets	
<i>Supplemental COLA</i>	\$0
<i>Retiree Health Benefit Reserve (BOR)</i>	0
<i>Contingency Reserve</i>	0
<i>Board Contingency Reserve/Undistributed Earnings ("Available Earnings")</i>	0
<i>Market Stabilization Reserve</i>	(122,286,713)
Total	\$(122,286,713)
<i>Market Value of Assets</i>	\$4,407,221,766
<i>Note: Results may not total properly due to rounding.</i>	

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT H

Development of Unfunded Actuarial Accrued Liability as of June 30, 2017

		(Dollar amounts in Thousands)
1	Unfunded actuarial accrued liability at beginning of year	\$1,194,148
2	Total Normal Cost payable at middle of year ⁽¹⁾	112,990
3	Expected administrative expenses	4,426
4	Expected employer and member contributions ⁽²⁾	(267,118)
5	Interest (full year on (1) plus half year on (2) + (3) + (4))	<u>79,069</u>
6	Expected unfunded actuarial accrued liability at end of year	\$1,123,515
7	Actuarial (gain)/loss due to all changes:	
	<u>Experience (gain)/loss</u>	
a.	Loss from investment return on valuation value of assets (6.36%)	\$27,432
b.	Loss from actual contributions less than expected ⁽³⁾	33,501
c.	Gain from lower than expected salary increases	(16,634)
d.	Gain from lower than expected COLA increases	(45,521)
e.	Other experience gains	<u>(8,357)</u>
f.	Subtotal	\$(9,579)
8	Actual unfunded actuarial accrued liability at end of year (6) + (7f)	\$1,113,936

⁽¹⁾ Excludes administrative expense load.

⁽²⁾ Includes contributions toward administrative expenses.

⁽³⁾ Contribution loss from one-year delay in implementing higher contribution rates recommended in June 30, 2016 valuation.

Notes: The "Net gain from other experience" of \$37,011,000 shown in Section 2, Chart 9 is equal to the sum of items 7(b) through 7(e).

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT I

Section 415 Limitations

Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual's account in a defined contribution plan.

A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active participants could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan's assets.

In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar indexed for inflation. That limit is \$215,000 for 2017 and \$220,000 for 2018. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must generally be adjusted based on each participant's circumstances, for such things as age at retirement, form of benefits chosen and after tax contributions.

For non-PEPRA members, benefits in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m).

Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard.

Contributions rates determined in this valuation have not been reduced for the Section 415 limitations. Actual limitations will result in gains as they occur.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

EXHIBIT J

Definitions of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Assumptions or Actuarial

Assumptions:

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan is anticipated to earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners at each age;
- (c) Retirement rates — the rate or probability of retirement at a given age; and
- (d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

Normal Cost:

The amount of contributions required to fund the determined cost allocated to the current year of service, as a level % of payroll over the members' career.

Actuarial Accrued Liability

For Actives:

The equivalent of the accumulated normal costs allocated to the years before the valuation date.

Actuarial Accrued Liability

For Pensioners:

The single sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

Unfunded (Overfunded) Actuarial

Accrued Liability:

The extent to which the actuarial accrued liability of the Plan exceeds (or is exceeded by) the assets of the Plan. There are many approaches to paying off the unfunded or overfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

SECTION 3: Supplemental Information for the Fresno County Employees' Retirement Association

**Amortization of the Unfunded
(Overfunded) Actuarial
Accrued Liability:**

Payments made over a period of years equal in value to the Plan's unfunded or overfunded actuarial accrued liability.

Rate of Investment Return:

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the gains and losses on the market value of assets to avoid significant swings in the value of assets from one year to the next.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

EXHIBIT I

Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1. Retired members as of the valuation date (including 921 beneficiaries in pay status)	7,200
2. Members inactive during year ended June 30, 2017 with vested rights	3,411
3. Members active during the year ended June 30, 2017	7,353

The actuarial factors as of the valuation date are as follows (amounts in 000s):

1. Normal cost ⁽¹⁾		\$113,281
2. Present value of future benefits		6,513,126
3. Present value of future normal costs (employer and member)		869,682
4. Actuarial accrued liability ⁽²⁾		5,643,444
Retired members and beneficiaries	\$3,458,158	
Inactive members with vested rights	306,459	
Active members	1,878,827	
5. Valuation value of assets ⁽²⁾ (\$4,407,222 at market value as reported by FCERA)		4,529,508
6. Unfunded actuarial accrued liability		\$1,113,936

⁽¹⁾ Includes administrative expense load.

⁽²⁾ Excludes non-valuation reserves and designations.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

EXHIBIT I (continued)

Summary of Actuarial Valuation Results

The determination of the recommended average employer contribution is as follows	Dollar Amount (in 000s)	% of Payroll
1. Total Normal Cost	\$113,281	27.38%
2. Expected member contributions	<u>-39,184</u>	<u>-9.47%</u>
3. Employer normal cost: (1) + (2)	\$74,097	17.91%
4. Amortization of Unfunded Actuarial Accrued Liability	<u>157,303</u>	<u>38.02%</u>
5. Total recommended average employer contribution: (3) + (4)	\$231,400	55.93%
6. Projected compensation	\$413,760	

Note: Both total normal cost and total UAAL rates include an explicit administrative expense load.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

EXHIBIT II

Actuarial Assumptions and Actuarial Cost Method

Rationale for Assumptions:	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the July 1, 2012 through June 30, 2015 Actuarial Experience Study and June 30, 2016 Economic Actuarial Assumptions Report both dated March 10, 2016. Unless otherwise noted, all actuarial assumptions and methods shown below apply to members for all tiers.
<u>Economic Assumptions</u>	
Net Investment Return:	7.00%, net of investment expenses.
Administrative Expenses:	1.10% of payroll, 0.94% allocated to the employers and 0.16% allocated to the members based on the components of the total average contribution rate (before expenses) for the employer and member
Employee Contribution Crediting Rate:	3.00%, compounded semi-annually. (The difference between the 7.00% net investment return assumption and 3.00% is credited to the other valuation reserves.)
Consumer Price Index:	Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 3.00% maximum change per year for General Tiers 1, 2 and 3, and Safety Tiers 1 and 2. General and Safety Tiers 4 and 5 receive no COLA increases.
Payroll Growth:	Inflation of 3.00% per year plus “across the board” real salary increases of 0.50% per year.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Individual Salary Increases:

<u>Annual Rate of Compensation Increase</u>		
Inflation: 3.00%; plus “across the board” salary increases of 0.50% per year; plus the following merit and promotional increases.		
Service	General	Safety
0	8.00%	8.00%
1	7.00%	7.00%
2	6.00%	5.50%
3	5.00%	5.50%
4	4.00%	5.00%
5	2.75%	3.75%
6	2.25%	3.25%
7	1.25%	2.75%
8 or more	1.00%	1.40%

*Increase in Section 7522.10
Compensation Limit:*

Increase of 3.00% per year from the valuation date.

Demographic Assumptions

Post – Retirement Mortality Rates:

Healthy:

For General Members and all Beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females.

For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set back two years.

Disabled:

For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward eight years.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward seven years.

The above mortality tables contain about a 20% margin, based on actual to expected deaths, to reflect future mortality improvement, based on a review of mortality experience as of the measurement date.

Member Contribution Rates and Optional Benefits:

For General Members and Beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females, weighted 35% male and 65% female for members and weighted 65% male and 35% female for beneficiaries.

For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set back two years weighted, 80% male and 20% female.

For Safety Beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females, weighted 20% male and 80% female.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Termination Rates Before Retirement:

Pre – Retirement Mortality Rates: For General and Safety Members: Headcount-Weighted RP-2014 Healthy Employee Mortality Table projected 20 years with the two-dimensional scale MP2015D times 75%. All pre-retirement deaths are assumed to be non-service connected deaths.

Age	Rate (%) Mortality			
	General ⁽¹⁾		Safety ⁽¹⁾	
	Male	Female	Male	Female
25	0.03	0.01	0.03	0.01
30	0.03	0.02	0.03	0.02
35	0.04	0.02	0.04	0.02
40	0.04	0.03	0.04	0.03
45	0.07	0.05	0.07	0.05
50	0.11	0.08	0.11	0.08
55	0.20	0.13	0.20	0.13
60	0.35	0.19	0.35	0.19
65	0.60	0.27	0.60	0.27

⁽¹⁾ All pre-retirement deaths are assumed to be non-service connected.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Termination Rates Before Retirement (Continued):

Age	Rate (%) Disability		
	General ⁽¹⁾		Safety ⁽²⁾
	Male	Female	Male and Female
20	0.01	0.01	0.05
25	0.01	0.02	0.11
30	0.02	0.02	0.24
35	0.04	0.06	0.42
40	0.12	0.10	0.56
45	0.21	0.14	0.66
50	0.25	0.17	0.76
55	0.31	0.24	1.52
60	0.68	0.33	3.20
65	0.96	0.59	4.00
70	1.00	0.90	4.00

⁽¹⁾ 50% of General disabilities are assumed to be duty disabilities. The other 50% are assumed to be ordinary disabilities.

⁽²⁾ 100% of Safety disabilities are assumed to be duty disabilities.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Termination Rates Before Retirement (Continued):

Rate (%)		
Total Termination (< 5 Years of Service)		
Years of Service	General	Safety
0	17.00	14.00
1	9.50	7.50
2	8.00	6.00
3	7.00	5.00
4	6.75	4.75

Rate (%)		
Total Termination (5+ Years of Service)		
Age	General	Safety
20	5.75	3.50
25	5.75	3.50
30	5.30	2.90
35	4.55	2.20
40	3.92	1.85
45	3.58	1.60
50	3.44	1.50
55	3.31	1.50
60	3.10	0.60
65	3.00	0.00
70	1.20	0.00

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Termination Rates Before Retirement (Continued):

Proportion of Total Termination Assumed to Receive Refunds and Deferred Vested Benefits (%)		
Years of Service	Refunds	Deferred Vested Benefits
0-4	60.00	40.00
5-9	30.00	70.00
10-14	25.00	75.00
15-19	15.00	85.00
20 or more	10.00	90.00

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Retirement Rates:

Rate (%)						
General						
Age	Tier 1	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
	Male	Female	Male & Female	Male & Female	Male & Female	Male & Female
50	5.00	4.00	3.00	2.40	2.00	0.00
51	3.50	4.00	3.00	2.40	2.00	0.00
52	3.00	4.00	3.60	2.80	2.50	4.50
53	4.00	4.00	3.60	2.80	2.50	2.00
54	4.00	6.00	4.20	3.40	3.00	2.50
55	8.00	9.00	8.40	6.70	4.00	3.50
56	9.00	11.00	10.00	8.00	5.00	4.50
57	14.00	14.00	10.00	8.00	6.00	5.50
58	15.00	15.00	10.00	8.00	7.00	6.50
59	16.00	16.00	10.00	12.00	8.00	7.50
60	25.00	20.00	15.00	15.40	9.00	8.50
61	20.00	22.00	15.00	15.40	10.00	9.50
62	25.00	28.00	25.00	27.40	16.00	15.00
63	25.00	22.00	24.00	19.00	16.00	15.00
64	25.00	25.00	24.00	19.00	19.00	18.00
65	45.00	35.00	35.00	34.60	23.00	22.00
66	40.00	35.00	34.00	26.60	20.00	20.00
67	40.00	35.00	34.00	26.60	20.00	20.00
68	40.00	45.00	35.00	32.00	25.00	25.00
69	50.00	45.00	35.00	37.00	30.00	30.00
70	50.00	50.00	70.00	60.00	60.00	60.00
71	50.00	50.00	70.00	60.00	60.00	60.00
72	50.00	50.00	70.00	60.00	60.00	60.00
73	50.00	50.00	70.00	60.00	60.00	60.00
74	50.00	50.00	70.00	60.00	60.00	60.00
75	100.00	100.00	100.00	100.00	100.00	100.00

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Retirement Rates (Continued):

Rate (%)			
Safety			
Age	Tier 1 & Tier 2	Tier 4	Tier 5
	Male & Female	Male & Female	Male & Female
45	1.00	1.00	0.00
46	1.00	1.00	0.00
47	1.00	1.00	0.00
48	1.00	1.00	0.00
49	3.00	2.00	0.00
50	5.00	4.00	4.00
51	7.00	4.00	4.00
52	8.00	5.00	5.00
53	14.00	6.00	6.00
54	27.00	11.00	11.00
55	40.00	20.00	20.00
56	25.00	20.00	20.00
57	25.00	20.00	25.00
58	20.00	20.00	20.00
59	20.00	23.00	23.00
60	40.00	45.00	45.00
61	40.00	45.00	45.00
62	50.00	45.00	45.00
63	50.00	45.00	45.00
64	50.00	45.00	45.00
65	100.00	100.00	100.00

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

**Retirement Age and Benefit for
Deferred Vested Members:**

For current deferred vested members, retirement assumptions are as follows:

General: Age 58
Safety: Age 54

We assume that 20% of future General and 30% of future Safety deferred vested members terminated with less than five years of service will continue to work for a reciprocal employer. For those future deferred vested members terminated with five or more years of service, we assume that 35% of General and 55% of Safety will continue to work for a reciprocal employer. In addition, we assume 4.50% and 4.90% compensation increases per annum for General and Safety members, respectively.

Future Benefit Accruals:

1.0 year of service per year of employment.

Annual Leave Conversion:

Eligibility for annual leave plans is determined based on hire date along with other factors. The number of members in each plan used to set the assumptions below can be found on page 59 of our July 1, 2012 through June 30, 2015 Actuarial Experience Study. The following assumptions for the amount of service converted from unused annual leave at retirement are used:

New Annual Leave Plan: 35 hours per year of service.

Annual Leave Plan II: 25 hours per year of service.

Vacation/Sick Leave Plans: 35 hours per year of service for General and 40 hours per year of service for Safety.

Annual Leave IV Plan or
the Old Annual Leave Plan: Based on actual hours in a member's frozen time-off bank.

Unknown Data for Members:

Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

**Inclusion of Deferred Vested
Members:**

All deferred vested members are included in the valuation.

Percent Married:

75% of male members; 50% of female members.

Age of Spouse:

Male retirees are 3 years older than their spouses, and Female retirees are 2 years younger than their spouses.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Actuarial Methods

Actuarial Value of Assets:

The actuarial value of assets is determined by recognizing any difference between actual and expected market return over 10 six-month interest crediting periods. The actuarial value of assets is further adjusted, if necessary, to be within 30% of the market value of assets.

Valuation Value of Assets:

The actuarial value of assets, reduced by the value of the non-valuation reserves.

Actuarial Cost Method:

Entry Age Cost Method. Entry Age is the age at the member's hire date. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation.

Changes in Actuarial Assumptions and Methods:

None.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

EXHIBIT III

Summary of Plan Provisions

This exhibit summarizes the major provisions of the FCERA included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Membership Eligibility:

	Membership with FCERA usually begins with the first day of the pay period following the date of appointment to a permanent position of at least 50% full-time.
<i>General and Safety Tier 1</i>	All General and Safety members hired on or before February 26, 2006 and General and Safety members of certain bargaining units hired after February 26, 2006.
<i>General and Safety Tier 2</i>	General and Safety members of certain bargaining units hired after February 26, 2006 and former Tier 1 members hired on or before February 26, 2006 who have elected to transfer to Tier 2.
<i>General Tier 3</i>	General members of certain bargaining units hired after December 17, 2007 and those eligible Tier 2 members hired on or before December 17, 2007.
<i>General and Safety Tier 4</i>	General and Safety County members hired on or after June 11, 2012 and prior to January 1, 2013.
<i>General and Safety Tier 5</i>	All General and Safety members hired on or after January 1, 2013.

Final Compensation for Benefit Determination:

<i>General and Safety Tiers 1 & 2</i>	Highest one-year average final compensation (§31462.1) (FAS1).
<i>General Tiers 3 & 4 and Safety Tier 4</i>	Highest three-year average final compensation (§31462) (FAS3).
<i>General and Safety Tier 5</i>	Highest consecutive three years of pensionable compensation (§7522.10(c), §7522.32 and §7522.34) (FAS3)

Service:	Years of service (Yrs).
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SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Service Retirement Eligibility:

General

General Tiers 1, 2, 3 &4

Age 50 with 10 years of service, or age 70 regardless of service, or after 30 years of service, regardless of age (§31672).

General Tier 5

Age 52 with 5 years of service (§7522.20(a)) or age 70 regardless of service (§31672.3).

Safety

Safety Tiers 1, 2 &4

Age 50 with 10 years of service, or after 30 years of service, regardless of age (§31663.25).

Safety Tier 5

Age 50 with 5 years of service (§7522.25(d)) or age 70 regardless of service (§31672.3).

Benefit Formula:

	Retirement Age	Benefit Formula
<i>General Tier 1</i>	50	$(1.86\% \times \text{FAS1} - 1/3 \times 1.86\% \times \$350 \times 12) \times \text{Yrs}$
<i>Regular plus Settlement benefit pursuant to Ventura Settlement Agreement*</i>	55	$(2.50\% \times \text{FAS1} - 1/3 \times 2.50\% \times \$350 \times 12) \times \text{Yrs}$
	60 or later	$(3.27\% \times \text{FAS1} - 1/3 \times 3.27\% \times \$350 \times 12) \times \text{Yrs}$
<i>General Tier 2 (§31676.16)</i>	50	$(1.43\% \times \text{FAS1} - 1/3 \times 1.43\% \times \$350 \times 12) \times \text{Yrs}$
	55	$(2.00\% \times \text{FAS1} - 1/3 \times 2.00\% \times \$350 \times 12) \times \text{Yrs}$
	60	$(2.26\% \times \text{FAS1} - 1/3 \times 2.26\% \times \$350 \times 12) \times \text{Yrs}$
	62	$(2.37\% \times \text{FAS1} - 1/3 \times 2.37\% \times \$350 \times 12) \times \text{Yrs}$
	63 or later	$(2.42\% \times \text{FAS1} - 1/3 \times 2.42\% \times \$350 \times 12) \times \text{Yrs}$
<i>General Tier 3 (§31676.15)</i>	50	$(1.49\% \times \text{FAS3} - 1/3 \times 1.49\% \times \$350 \times 12) \times \text{Yrs}$
	55	$(2.00\% \times \text{FAS3} - 1/3 \times 2.00\% \times \$350 \times 12) \times \text{Yrs}$
	60	$(2.62\% \times \text{FAS3} - 1/3 \times 2.62\% \times \$350 \times 12) \times \text{Yrs}$
	62	$(2.82\% \times \text{FAS3} - 1/3 \times 2.82\% \times \$350 \times 12) \times \text{Yrs}$
	65 or later	$(3.13\% \times \text{FAS3} - 1/3 \times 3.13\% \times \$350 \times 12) \times \text{Yrs}$

* Please refer to the discussion on page iv of this report for breakdown between Regular and Settlement benefits we use for determining contribution rate requirements for funding purposes.

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	Retirement Age	Benefit Formula
<i>General Tier 4 (§31676.1)</i>	50	$(1.18\% \times \text{FAS3} - 1/3 \times 1.18\% \times \$350 \times 12) \times \text{Yrs}$
	55	$(1.49\% \times \text{FAS3} - 1/3 \times 1.49\% \times \$350 \times 12) \times \text{Yrs}$
	60	$(1.92\% \times \text{FAS3} - 1/3 \times 1.92\% \times \$350 \times 12) \times \text{Yrs}$
	62	$(2.09\% \times \text{FAS3} - 1/3 \times 2.09\% \times \$350 \times 12) \times \text{Yrs}$
	65 or later	$(2.43\% \times \text{FAS3} - 1/3 \times 2.43\% \times \$350 \times 12) \times \text{Yrs}$
<i>General Tier 5 (§7522.20(a))</i>	52	$1.00\% \times \text{FAS3} \times \text{Yrs}$
	55	$1.30\% \times \text{FAS3} \times \text{Yrs}$
	60	$1.80\% \times \text{FAS3} \times \text{Yrs}$
	62	$2.00\% \times \text{FAS3} \times \text{Yrs}$
	65	$2.30\% \times \text{FAS3} \times \text{Yrs}$
	67 or later	$2.50\% \times \text{FAS3} \times \text{Yrs}$
<i>Safety Tier 1</i>	50	$(2.50\% \times \text{FAS1} - 1/3 \times 2.50\% \times \$350 \times 12) \times \text{Yrs}$
<i>Regular plus Settlement benefit pursuant to Ventura Settlement Agreement*</i>	55 or later	$(3.27\% \times \text{FAS1} - 1/3 \times 3.27\% \times \$350 \times 12) \times \text{Yrs}$
<i>Safety Tier 2 (§31664.2)</i>	50	$(2.29\% \times \text{FAS1} - 1/3 \times 2.29\% \times \$350 \times 12) \times \text{Yrs}$
	55 or later	$(3.00\% \times \text{FAS1} - 1/3 \times 3.00\% \times \$350 \times 12) \times \text{Yrs}$
<i>Safety Tier 4 (§31664)</i>	50	$(2.00\% \times \text{FAS3} - 1/3 \times 2.00\% \times \$350 \times 12) \times \text{Yrs}$
	55 or later	$(2.62\% \times \text{FAS3} - 1/3 \times 2.62\% \times \$350 \times 12) \times \text{Yrs}$
<i>Safety Tier 5 (§7522.25(d))</i>	50	$2.00\% \times \text{FAS3} \times \text{Yrs}$
	55	$2.50\% \times \text{FAS3} \times \text{Yrs}$
	57 or later	$2.70\% \times \text{FAS3} \times \text{Yrs}$

* For funding purposes, contribution rate for Regular benefit is calculated pursuant under Section §31664 and the contribution rate for Settlement benefit is the difference between the benefit described above and the benefit under Section §31664.

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Maximum Benefit:

<i>General Tiers 1, 2, 3 & 4 and Safety Tiers 1, 2 & 4</i>	100% of Final Compensation (§31676.14, §31676.16, §31676.15, §31676.1, §31664 and §31664.2).
<i>General Tier 5 and Safety Tier 5</i>	None.

Ordinary Disability:*

<u><i>General Tiers 1, 2, 4 & 5</i></u>	
<i>Eligibility</i>	Five years of service (§31720).
<i>Benefit Formula</i>	1.5% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 65, but the total benefit cannot be more than one-third of Final Compensation. The service retirement benefit is paid, if greater.
<u><i>General Tier 3</i></u>	
<i>Eligibility</i>	Five years of service (§31720).
<i>Benefit Formula</i>	1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 65, but the total benefit cannot be more than one-third of Final Compensation. The service retirement benefit is paid, if greater.
<u><i>Safety Tiers 1, 2, 4 & 5</i></u>	
<i>Eligibility</i>	Five years of service (§31720).
<i>Benefit Formula</i>	1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 55, but the total benefit cannot be more than one-third of Final Compensation. The service retirement benefit is paid, if greater.

* For General and Safety Tier 1 members who retire because of disability, there is an allocation of the value of their disability benefits made by the Association's Pension Administration System between the "Regular" and "Settlement" benefits assuming those members would have been eligible to retire and collect a service retirement benefit. While it does not change the total contribution rates paid by each of the employer and the employee, consistent with the prior valuations we have continued in this valuation to adjust the allocation of the rates between "Regular" and "Settlement" benefits so as to be consistent with the allocation made by the Association's Pension Administration System.

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Line-of-Duty Disability:*

All Members

Eligibility

No age or service requirements (§31720).

Benefit Formula

50% of the Final Compensation or 100% of Service Retirement benefit, if greater (§31727.4).

Pre-Retirement Death:

All Members

Eligibility

None.

Basic lump sum benefit

Refund of employee contributions with interest, plus one month's compensation for each year of service, to a maximum of six months' compensation (§31781).

Death in line of duty

50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).

OR

Vested Members

Eligibility

Five years of service.

Basic benefit

60% of the greater of Service or Ordinary Disability Retirement benefit payable to surviving eligible spouse (§31765.1, §31781.1), in lieu of the basic lump sum benefit above.

Death in line of duty

50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).

** For General and Safety Tier 1 members who retire because of disability, there is an allocation of the value of their disability benefits made by the Association's Pension Administration System between the "Regular" and "Settlement" benefits assuming those members would have been eligible to retire and collect a service retirement benefit. While it does not change the total contribution rates paid by each of the employer and the employee, consistent with the prior valuations we have continued in this valuation to adjust the allocation of the rates between "Regular" and "Settlement" benefits so as to be consistent with the allocation made by the Association's Pension Administration System.*

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Death After Retirement:

All Members

Service or

Ordinary Disability Retirement

60% of member's unmodified allowance continued to eligible spouse (§31760.1). An eligible spouse is a surviving spouse who was married to the member at least one year prior to the date of retirement (§31760.1) or at least two years prior to the date of death and has attained age 55 on or prior to the date of death (§31786.1).

Line-of-Duty Disability

100% of member's allowance continued to eligible spouse (§31786).

Withdrawal Benefits:

Less than Five Years of Service

Refund of accumulated employee contributions with interest, or earned benefit at age 70 (§31628). Effective January 1, 2003, a member may also elect to leave contributions on deposit in the retirement fund (§31629.5).

Five or More Years of Service

If contributions left on deposit, entitled to earned benefits commencing at any time after eligible to retire (§31700).

Post-retirement

Cost-of-Living Benefits:

General Tiers 1, 2 & 3 and Safety Tiers 1 & 2

Future changes based on Consumer Price Index to a maximum of 3% per year; excess "banked" (§31870.1).

General Tiers 4 & 5 and Safety Tiers 4 & 5

None.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Conversion of Annual Leave

General members

New Annual Leave Plan (5Y)	Members who entered the plan on or before October 10, 1983 and in bargaining groups who have agreed to this plan may convert hours in excess of 1,100 hours.
Annual Leave Plan II (5Y)	Members who entered the plan after October 10, 1983 with accruals in the 5Y leave plan and in bargaining groups who have agreed to this plan may convert hours in excess of 400 hours.
Vacation/Sick Leave Plans (5Q, 5S and 5W)	Members who entered the plan on or after December 14, 1998 and in bargaining groups who have agreed to these plans may convert all accrued sick leave hours to service upon retirement.
Annual Leave IV Plan or the Old Annual Leave Plan (5O)	Members hired on or after October 10, 1983 or prior to that date, respectively, and who are in bargaining groups who have agreed to these plans, management or are unrepresented will convert any frozen hours balance to service at retirement.

Safety members

New Annual Leave Plan (5Y)	Members who entered the plan on or before October 10, 1983 and in bargaining groups who have agreed to this plan may convert hours in excess of 1,100 hours.
Annual Leave Plan II (5Y)	Members who entered the plan after October 10, 1983 with accruals in the 5Y leave plan and in bargaining groups who have agreed to this plan may convert hours in excess of 400 hours.
Vacation/Sick Leave Plans (5Q, 5S and 5W)	Members who entered the plan on or after December 14, 1998 and in bargaining groups who have agreed to these plans may convert all accrued sick leave hours to service.
Annual Leave IV Plan or the Old Annual Leave Plan (5O)	Members hired on or after October 10, 1983 or prior to that date, respectively, and who are in bargaining groups who have agreed to these plans, management or are unrepresented will convert any frozen hours balance to service at retirement.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

County Contributions:	Unfunded Actuarial Accrued Liability established as of June 30, 2003 is amortized over a declining period with 16-years remaining. Unfunded Actuarial Accrued Liability established as a result of the Tier 3 benefit improvement is amortized over a declining period with 20-years remaining. The amortization period for UAAL established on each subsequent valuation as a result of actuarial gains or losses, changes in actuarial assumptions or plan amendments is a declining 15-year period.
Ventura Settlement Benefits:	
Section 6	For Tier 1 members retiring on or after January 1, 2001 –The difference between the regular plus settlement benefits, and the regular benefit (i.e., Section 31676.12 for General Tier 1 and Section 31664 for Safety Tier 1)
Section 8	For Tier 1 members who retired prior to January 1, 2001 - \$15 per month per year of service, up to a maximum monthly benefit of \$450.
Section 9	All retired members (excluding General Tiers 4 & 5 and Safety Tier 5 members) are entitled to a \$3 per month per year of service benefit. Future increase in this benefit will be tied to the amount of future undistributed earnings. For the purpose of this valuation, it is assumed that there will be no future increase in the amount of benefit.
Member Contributions:	Please refer to Appendix A for specific rates.
<i>General Tier 1</i>	
<i>Regular Basic</i>	Provide for an average annuity at age 60 equal to 1/200 of FAS1 (§31621.5).
<i>Regular Plus Settlement Basic</i>	Provide for an average annuity at age 55 equal to 1/160 of FAS1 (§31627).
<i>Cost-of-Living</i>	Provide for one-half of future Cost-of-Living costs.
<i>General Tier 2</i>	
<i>Basic</i>	Provide for an average annuity at age 60 equal to 1/240 of FAS1 (§31621.4).
<i>Cost-of-Living</i>	Provide for one-half of future Cost-of-Living costs.
<i>General Tier 3</i>	
<i>Basic</i>	Provide for an average annuity at age 55 equal to 1/200 of FAS3 (§31621.6 and §31630).
<i>Cost-of-Living</i>	Provide for one-half of future Cost-of-Living costs.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

General Tier 4

Basic

Provide for an average annuity at age 60 equal to 1/120 of FAS3 (§31621).

Cost-of-Living

Not applicable.

General Tier 5

50% of the total Normal Cost rate.

Safety Tier 1

Regular Basic

Provide for an average annuity at age 50 equal to 1/200 of FAS1 (§31639.5).

Regular Plus Settlement Basic

Provide for an average annuity at age 50 equal to 1/160 of FAS1 (§31627).

Cost-of-Living

Provide for one-half of future Cost-of-Living costs.

Safety Tier 2

Basic

Provide for an average annuity at age 50 equal to 1/200 of FAS1 (§31639.5).

Cost-of-Living

Provide for one-half of future Cost-of-Living costs.

Safety Tier 4

Basic

Provide for an average annuity at age 50 equal to 1/100 of FAS3 (§31639.25).

Cost-of-Living

Not applicable.

Safety Tier 5

50% of the total Normal Cost rate.

Other Information:

Non-Tier 5 Safety members with 30 or more years of service are exempt from paying member contributions. The same applies for General members hired on or before March 7, 1973.

NOTE: *The summary of major plan provisions is designed to outline principal plan benefits as interpreted for purposes of the actuarial valuation. If the Association should find the plan summary not in accordance with the actual provisions, the Association should alert Segal, to ensure the proper provisions are valued.*

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix A

Member Contribution Rates

Comparison of Total Member Rate from June 30, 2017 (New) and June 30, 2016 (Current) Valuations

General Tier 1 ⁽¹⁾				General Tier 2 ⁽¹⁾			
Entry Age	Current ⁽²⁾	New ⁽²⁾	Change	Entry Age	Current ⁽²⁾	New ⁽²⁾	Change
25	9.21%	9.20%	-0.01%	25	6.15%	6.17%	0.02%
35	10.58%	10.56%	-0.02%	35	7.05%	7.07%	0.02%
45	12.42%	12.41%	-0.01%	45	8.15%	8.17%	0.02%
General Tier 3 ⁽¹⁾				General Tier 4 ⁽¹⁾			
Entry Age	Current ⁽²⁾	New ⁽²⁾	Change	Entry Age	Current ⁽²⁾	New ⁽²⁾	Change
25	7.24%	7.24%	0.00%	25	6.16%	6.16%	0.00%
35	8.32%	8.33%	0.01%	35	7.06%	7.06%	0.00%
45	9.75%	9.76%	0.01%	45	8.16%	8.16%	0.00%
General Tier 5							
Entry Age	Current ⁽²⁾	New ⁽²⁾	Change				
Any ⁽³⁾	7.26%	7.23%	-0.03%				

⁽¹⁾ For non-CalPEPRA members, contributions for the first \$350 of monthly payroll are based on 2/3 (no adjustment for the administrative expense load) of the above rates.

⁽²⁾ Includes an explicit administrative expense load of 0.16% of payroll that has been allocated to the Current and New member contribution rates.

⁽³⁾ CalPEPRA member rates are independent of entry age.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix A

Member Contribution Rates (Continued)

Comparison of Total Member Rate from June 30, 2017 (New) and June 30, 2016 (Current) Valuations

Safety Tier 1 ⁽¹⁾				Safety Tier 2 ⁽¹⁾			
Entry Age	Current ⁽²⁾	New ⁽²⁾	Change	Entry Age	Current ⁽²⁾	New ⁽²⁾	Change
25	13.21%	13.25%	0.04%	25	11.26%	11.25%	-0.01%
30	14.03%	14.08%	0.05%	30	11.96%	11.96%	0.00%
35	15.00%	15.03%	0.03%	35	12.79%	12.78%	-0.01%
Safety Tier 4 ⁽¹⁾				Safety Tier 5			
Entry Age	Current ⁽²⁾	New ⁽²⁾	Change	Entry Age	Current ⁽²⁾	New ⁽²⁾	Change
25	9.83%	9.83%	0.00%	Any ⁽³⁾	12.03%	12.07%	0.04%
30	10.45%	10.45%	0.00%				
35	11.16%	11.16%	0.00%				

⁽¹⁾ For non-CalPEPRA members, contributions for the first \$350 of monthly payroll are based on 2/3 (no adjustment for the administrative expense load) of the above rates.

⁽²⁾ Includes an explicit administrative expense load of 0.16% of payroll that has been allocated to the Current and New member contribution rates.

⁽³⁾ CalPEPRA member rates are independent of entry age.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix A

Member Contribution Rates (Continued)

General Tier 1 Members' Contribution Rates based on the June 30, 2017 Actuarial Valuation as a percentage of payroll

Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month	COLA Regular First \$350 per month	COLA Regular Over \$350 per month	Basic Settlement First \$350 per month	Basic Settlement Over \$350 per month	COLA Settlement First \$350 per month	COLA Settlement Over \$350 per month	Combined First \$350 per month	Combined Over \$350 per month
15	2.37%	3.47%	1.65%	2.48%	0.93%	1.39%	0.53%	0.79%	5.48%	8.13%
16	2.37%	3.47%	1.65%	2.48%	0.93%	1.39%	0.53%	0.79%	5.48%	8.13%
17	2.40%	3.52%	1.67%	2.51%	0.94%	1.41%	0.53%	0.80%	5.54%	8.24%
18	2.43%	3.57%	1.70%	2.55%	0.95%	1.42%	0.54%	0.81%	5.62%	8.35%
19	2.46%	3.62%	1.72%	2.58%	0.96%	1.44%	0.55%	0.82%	5.69%	8.46%
20	2.50%	3.67%	1.75%	2.62%	0.97%	1.46%	0.55%	0.83%	5.77%	8.58%
21	2.53%	3.71%	1.77%	2.66%	0.99%	1.49%	0.57%	0.85%	5.86%	8.71%
22	2.56%	3.77%	1.80%	2.70%	1.00%	1.50%	0.57%	0.86%	5.93%	8.83%
23	2.60%	3.82%	1.82%	2.73%	1.01%	1.52%	0.58%	0.87%	6.01%	8.94%
24	2.63%	3.87%	1.85%	2.77%	1.03%	1.55%	0.59%	0.88%	6.10%	9.07%
25	2.67%	3.92%	1.87%	2.81%	1.05%	1.57%	0.60%	0.90%	6.19%	9.20%
26	2.70%	3.97%	1.90%	2.85%	1.07%	1.60%	0.61%	0.91%	6.28%	9.33%
27	2.74%	4.03%	1.93%	2.89%	1.07%	1.61%	0.61%	0.92%	6.35%	9.45%
28	2.77%	4.08%	1.95%	2.93%	1.09%	1.64%	0.63%	0.94%	6.44%	9.59%
29	2.81%	4.14%	1.98%	2.97%	1.11%	1.66%	0.63%	0.95%	6.53%	9.72%
30	2.85%	4.19%	2.01%	3.01%	1.13%	1.69%	0.64%	0.96%	6.63%	9.85%
31	2.89%	4.25%	2.04%	3.06%	1.14%	1.71%	0.65%	0.98%	6.72%	10.00%
32	2.92%	4.31%	2.07%	3.10%	1.15%	1.73%	0.66%	0.99%	6.80%	10.13%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Entry Age	Basic Regular	Basic Regular	COLA Regular	COLA Regular	Basic Settlement	Basic Settlement	COLA Settlement	COLA Settlement	Combined	Combined
	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month
33	2.96%	4.37%	2.09%	3.14%	1.17%	1.76%	0.67%	1.00%	6.89%	10.27%
34	3.00%	4.42%	2.13%	3.19%	1.19%	1.79%	0.68%	1.02%	7.00%	10.42%
35	3.04%	4.49%	2.15%	3.23%	1.21%	1.81%	0.69%	1.03%	7.09%	10.56%
36	3.08%	4.55%	2.19%	3.28%	1.23%	1.84%	0.70%	1.05%	7.20%	10.72%
37	3.13%	4.61%	2.22%	3.33%	1.25%	1.88%	0.71%	1.07%	7.31%	10.89%
38	3.17%	4.67%	2.25%	3.37%	1.27%	1.91%	0.73%	1.09%	7.42%	11.04%
39	3.21%	4.74%	2.28%	3.42%	1.29%	1.94%	0.74%	1.11%	7.52%	11.21%
40	3.26%	4.81%	2.31%	3.47%	1.31%	1.97%	0.75%	1.12%	7.63%	11.37%
41	3.30%	4.87%	2.35%	3.52%	1.35%	2.02%	0.77%	1.15%	7.77%	11.56%
42	3.35%	4.94%	2.39%	3.58%	1.37%	2.06%	0.79%	1.18%	7.90%	11.76%
43	3.40%	5.02%	2.42%	3.63%	1.40%	2.10%	0.80%	1.20%	8.02%	11.95%
44	3.45%	5.09%	2.46%	3.69%	1.44%	2.16%	0.82%	1.23%	8.17%	12.17%
45	3.50%	5.17%	2.50%	3.75%	1.48%	2.22%	0.85%	1.27%	8.33%	12.41%
46	3.55%	5.25%	2.54%	3.81%	1.53%	2.29%	0.87%	1.31%	8.49%	12.66%
47	3.61%	5.34%	2.58%	3.87%	1.57%	2.35%	0.89%	1.34%	8.65%	12.90%
48	3.67%	5.43%	2.63%	3.94%	1.58%	2.37%	0.90%	1.35%	8.78%	13.09%
49	3.73%	5.52%	2.67%	4.01%	1.58%	2.37%	0.90%	1.35%	8.88%	13.25%
50	3.80%	5.63%	2.73%	4.09%	1.53%	2.29%	0.87%	1.31%	8.93%	13.32%
51	3.88%	5.74%	2.78%	4.17%	1.44%	2.16%	0.82%	1.23%	8.92%	13.30%
52	3.96%	5.86%	2.84%	4.26%	1.32%	1.98%	0.75%	1.13%	8.87%	13.23%
53	4.01%	5.94%	2.88%	4.32%	1.19%	1.79%	0.68%	1.02%	8.76%	13.07%
54	4.06%	6.01%	2.91%	4.37%	1.05%	1.57%	0.60%	0.90%	8.62%	12.85%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month	COLA Regular First \$350 per month	COLA Regular Over \$350 per month	Basic Settlement First \$350 per month	Basic Settlement Over \$350 per month	COLA Settlement First \$350 per month	COLA Settlement Over \$350 per month	Combined First \$350 per month	Combined Over \$350 per month
55	4.07%	6.03%	2.93%	4.39%	1.05%	1.57%	0.60%	0.90%	8.65%	12.89%
56	4.06%	6.02%	2.92%	4.38%	1.05%	1.57%	0.60%	0.90%	8.63%	12.87%
57	4.03%	5.97%	2.89%	4.34%	1.05%	1.57%	0.60%	0.90%	8.57%	12.78%
58	3.98%	5.89%	2.85%	4.28%	1.05%	1.57%	0.60%	0.90%	8.48%	12.64%
59+	3.90%	5.77%	2.79%	4.19%	1.05%	1.57%	0.60%	0.90%	8.34%	12.43%

Interest:	7.00% per annum
COLA:	3.00%
Administrative Expenses:	0.16% of payroll added to Basic Regular rates
Mortality:	Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females, weighted 35% male and 65% female
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See Exhibit II)
COLA Loading Factor:	74.76% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses, and 57.08% for Settlement Benefits.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association**Appendix A****Member Contribution Rates (Continued)**

General Tier 2 Members' Contribution Rates based on the June 30, 2017 Actuarial Valuation as a percentage of payroll						
Entry Age	Basic Regular	Basic Regular	COLA Regular	COLA Regular	Combined	Combined
	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month
15	2.00%	2.92%	1.69%	2.54%	3.69%	5.46%
16	2.00%	2.92%	1.69%	2.54%	3.69%	5.46%
17	2.03%	2.96%	1.71%	2.57%	3.74%	5.53%
18	2.05%	3.00%	1.74%	2.61%	3.79%	5.61%
19	2.08%	3.04%	1.77%	2.65%	3.85%	5.69%
20	2.11%	3.08%	1.79%	2.69%	3.90%	5.77%
21	2.13%	3.12%	1.81%	2.72%	3.94%	5.84%
22	2.16%	3.16%	1.84%	2.76%	4.00%	5.92%
23	2.19%	3.21%	1.87%	2.80%	4.06%	6.01%
24	2.22%	3.25%	1.89%	2.84%	4.11%	6.09%
25	2.25%	3.29%	1.92%	2.88%	4.17%	6.17%
26	2.28%	3.34%	1.95%	2.92%	4.23%	6.26%
27	2.31%	3.38%	1.97%	2.96%	4.28%	6.34%
28	2.34%	3.43%	2.01%	3.01%	4.35%	6.44%
29	2.37%	3.47%	2.03%	3.05%	4.40%	6.52%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Entry Age	Basic Regular	Basic Regular	COLA Regular	COLA Regular	Combined	Combined
	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month
30	2.40%	3.52%	2.06%	3.09%	4.46%	6.61%
31	2.43%	3.57%	2.09%	3.13%	4.52%	6.70%
32	2.46%	3.62%	2.12%	3.18%	4.58%	6.80%
33	2.50%	3.66%	2.15%	3.22%	4.65%	6.88%
34	2.53%	3.71%	2.18%	3.27%	4.71%	6.98%
35	2.56%	3.76%	2.21%	3.31%	4.77%	7.07%
36	2.60%	3.82%	2.24%	3.36%	4.84%	7.18%
37	2.63%	3.87%	2.27%	3.41%	4.90%	7.28%
38	2.67%	3.92%	2.31%	3.46%	4.98%	7.38%
39	2.70%	3.98%	2.34%	3.51%	5.04%	7.49%
40	2.74%	4.03%	2.37%	3.56%	5.11%	7.59%
41	2.78%	4.09%	2.41%	3.61%	5.19%	7.70%
42	2.82%	4.15%	2.45%	3.67%	5.27%	7.82%
43	2.86%	4.21%	2.48%	3.72%	5.34%	7.93%
44	2.90%	4.27%	2.52%	3.78%	5.42%	8.05%
45	2.94%	4.33%	2.56%	3.84%	5.50%	8.17%
46	2.99%	4.40%	2.60%	3.90%	5.59%	8.30%
47	3.04%	4.47%	2.65%	3.97%	5.69%	8.44%
48	3.09%	4.55%	2.69%	4.04%	5.78%	8.59%
49	3.14%	4.63%	2.74%	4.11%	5.88%	8.74%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Entry Age	Basic Regular	Basic Regular	COLA Regular	COLA Regular	Combined	Combined
	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month
50	3.20%	4.71%	2.79%	4.19%	5.99%	8.90%
51	3.26%	4.81%	2.85%	4.28%	6.11%	9.09%
52	3.33%	4.91%	2.91%	4.37%	6.24%	9.28%
53	3.37%	4.97%	2.95%	4.43%	6.32%	9.40%
54	3.41%	5.03%	2.99%	4.48%	6.40%	9.51%
55	3.42%	5.05%	3.00%	4.50%	6.42%	9.55%
56	3.41%	5.04%	2.99%	4.49%	6.40%	9.53%
57	3.39%	5.00%	2.97%	4.45%	6.36%	9.45%
58	3.34%	4.93%	2.93%	4.39%	6.27%	9.32%
59+	3.28%	4.83%	2.87%	4.30%	6.15%	9.13%

Interest: 7.00% per annum

COLA: 3.00%

Administrative Expenses: 0.16% of payroll added to Basic Regular rates

Mortality: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females, weighted 35% male and 65% female

Salary Increase: Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See Exhibit II)

COLA Loading Factor: 91.97% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association**Appendix A****Member Contribution Rates (Continued)****General Tier 3 Members' Contribution Rates based on the June 30, 2017
Actuarial Valuation as a percentage of payroll**

Entry Age	Basic Regular	Basic Regular	COLA	COLA	Combined	Combined
	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month
15	2.56%	3.76%	1.77%	2.65%	4.33%	6.41%
16	2.56%	3.76%	1.77%	2.65%	4.33%	6.41%
17	2.59%	3.81%	1.79%	2.68%	4.38%	6.49%
18	2.63%	3.86%	1.81%	2.72%	4.44%	6.58%
19	2.66%	3.91%	1.84%	2.76%	4.50%	6.67%
20	2.70%	3.97%	1.87%	2.80%	4.57%	6.77%
21	2.73%	4.02%	1.89%	2.84%	4.62%	6.86%
22	2.77%	4.08%	1.92%	2.88%	4.69%	6.96%
23	2.81%	4.13%	1.95%	2.92%	4.76%	7.05%
24	2.84%	4.19%	1.97%	2.96%	4.81%	7.15%
25	2.88%	4.24%	2.00%	3.00%	4.88%	7.24%
26	2.92%	4.30%	2.03%	3.05%	4.95%	7.35%
27	2.96%	4.36%	2.06%	3.09%	5.02%	7.45%
28	3.00%	4.42%	2.09%	3.13%	5.09%	7.55%
29	3.04%	4.48%	2.12%	3.18%	5.16%	7.66%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Entry Age	Basic Regular	Basic Regular	COLA Regular	COLA Regular	Combined	Combined
	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month
30	3.08%	4.54%	2.15%	3.22%	5.23%	7.76%
31	3.12%	4.60%	2.18%	3.27%	5.30%	7.87%
32	3.16%	4.67%	2.21%	3.31%	5.37%	7.98%
33	3.21%	4.73%	2.24%	3.36%	5.45%	8.09%
34	3.25%	4.80%	2.27%	3.41%	5.52%	8.21%
35	3.30%	4.87%	2.31%	3.46%	5.61%	8.33%
36	3.34%	4.93%	2.34%	3.51%	5.68%	8.44%
37	3.39%	5.01%	2.37%	3.56%	5.76%	8.57%
38	3.44%	5.08%	2.41%	3.62%	5.85%	8.70%
39	3.49%	5.15%	2.45%	3.67%	5.94%	8.82%
40	3.54%	5.23%	2.49%	3.73%	6.03%	8.96%
41	3.60%	5.32%	2.53%	3.79%	6.13%	9.11%
42	3.65%	5.40%	2.57%	3.85%	6.22%	9.25%
43	3.72%	5.49%	2.61%	3.92%	6.33%	9.41%
44	3.78%	5.59%	2.66%	3.99%	6.44%	9.58%
45	3.85%	5.69%	2.71%	4.07%	6.56%	9.76%
46	3.91%	5.78%	2.75%	4.13%	6.66%	9.91%
47	3.96%	5.86%	2.79%	4.19%	6.75%	10.05%
48	3.98%	5.90%	2.81%	4.22%	6.79%	10.12%
49	3.99%	5.91%	2.82%	4.23%	6.81%	10.14%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Entry Age	Basic Regular	Basic Regular	COLA Regular	COLA Regular	Combined	Combined
	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month
50	3.97%	5.88%	2.81%	4.21%	6.78%	10.09%
51	3.93%	5.82%	2.77%	4.16%	6.70%	9.98%
52	3.87%	5.72%	2.73%	4.09%	6.60%	9.81%
53	3.99%	5.90%	2.81%	4.22%	6.80%	10.12%
54+	4.12%	6.09%	2.91%	4.36%	7.03%	10.45%

Interest:	7.00% per annum
COLA:	3.00%
Administrative Expenses:	0.16% of payroll added to Basic Regular rates
Mortality:	Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females, weighted 35% male and 65% female
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See Exhibit II)
COLA Loading Factor:	73.54% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association**Appendix A****Member Contribution Rates (Continued)**

General Tier 4 Members' Contribution Rates based on the June 30, 2017 Actuarial Valuation as a percentage of payroll								
Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month	Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month	Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month
15	3.68%	5.45%	30	4.45%	6.59%	45	5.49%	8.16%
16	3.68%	5.45%	31	4.51%	6.69%	46	5.58%	8.28%
17	3.73%	5.52%	32	4.57%	6.78%	47	5.67%	8.42%
18	3.79%	5.60%	33	4.63%	6.87%	48	5.76%	8.56%
19	3.84%	5.68%	34	4.70%	6.97%	49	5.86%	8.72%
20	3.89%	5.75%	35	4.76%	7.06%	50	5.97%	8.88%
21	3.94%	5.83%	36	4.83%	7.16%	51	6.07%	9.02%
22	4.00%	5.91%	37	4.89%	7.26%	52	6.14%	9.13%
23	4.05%	5.99%	38	4.96%	7.36%	53	6.19%	9.20%
24	4.10%	6.08%	39	5.03%	7.47%	54	6.20%	9.22%
25	4.16%	6.16%	40	5.10%	7.57%	55	6.17%	9.17%
26	4.22%	6.24%	41	5.18%	7.68%	56	6.10%	9.07%
27	4.27%	6.33%	42	5.25%	7.80%	57	6.00%	8.93%
28	4.33%	6.42%	43	5.33%	7.91%	58	6.19%	9.21%
29	4.39%	6.51%	44	5.41%	8.03%	59+	6.39%	9.51%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Interest:	7.00% per annum
COLA:	0.00%
Administrative Expenses:	0.16% of payroll added to Basic Regular rates
Mortality:	Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females, weighted 35% male and 65% female
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See Exhibit II)

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix A

Member Contribution Rates (Continued)

**General Tier 5 Members' Contribution Rates based on the June 30, 2017
Actuarial Valuation as a percentage of payroll**

	<u>All Eligible Pay⁽¹⁾</u>
All members	7.23%
Administrative Expenses:	0.16% of payroll added to the rate

⁽¹⁾ *It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2017 is \$118,775. For an employer that is not enrolled in Social Security, the maximum amount is \$142,530 (reference Section 7522.10). These amounts are adjusted for changes to the Consumer Price Index for All Urban Consumers after 2017 (reference Section 7522.10(d)).*

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix A

Member Contribution Rates (Continued)

Safety Tier 1 Members' Contribution Rates based on the June 30, 2017 Actuarial Valuation as a percentage of payroll										
Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month	COLA Regular First \$350 per month	COLA Regular Over \$350 per month	Basic Settlement First \$350 per month	Basic Settlement Over \$350 per month	COLA Settlement First \$350 per month	COLA Settlement Over \$350 per month	Combined First \$350 per month	Combined Over \$350 per month
15	3.20%	4.71%	3.29%	4.93%	0.76%	1.14%	0.75%	1.13%	8.00%	11.91%
16	3.20%	4.71%	3.29%	4.93%	0.76%	1.14%	0.75%	1.13%	8.00%	11.91%
17	3.23%	4.77%	3.33%	4.99%	0.77%	1.15%	0.76%	1.14%	8.09%	12.05%
18	3.27%	4.82%	3.37%	5.05%	0.78%	1.17%	0.77%	1.16%	8.19%	12.20%
19	3.31%	4.88%	3.41%	5.11%	0.79%	1.18%	0.78%	1.17%	8.29%	12.34%
20	3.34%	4.93%	3.45%	5.17%	0.80%	1.20%	0.79%	1.19%	8.38%	12.49%
21	3.38%	4.99%	3.49%	5.23%	0.81%	1.21%	0.80%	1.20%	8.48%	12.63%
22	3.42%	5.05%	3.53%	5.29%	0.81%	1.22%	0.81%	1.21%	8.57%	12.77%
23	3.46%	5.11%	3.57%	5.36%	0.82%	1.23%	0.81%	1.22%	8.66%	12.92%
24	3.50%	5.17%	3.61%	5.42%	0.83%	1.25%	0.83%	1.24%	8.77%	13.08%
25	3.54%	5.23%	3.66%	5.49%	0.85%	1.27%	0.84%	1.26%	8.89%	13.25%
26	3.58%	5.29%	3.71%	5.56%	0.85%	1.28%	0.85%	1.27%	8.99%	13.40%
27	3.62%	5.35%	3.75%	5.62%	0.87%	1.30%	0.86%	1.29%	9.10%	13.56%
28	3.67%	5.42%	3.79%	5.69%	0.87%	1.31%	0.87%	1.30%	9.20%	13.72%
29	3.71%	5.48%	3.85%	5.77%	0.89%	1.33%	0.88%	1.32%	9.33%	13.90%
30	3.75%	5.55%	3.89%	5.84%	0.90%	1.35%	0.89%	1.34%	9.43%	14.08%
31	3.80%	5.62%	3.94%	5.91%	0.91%	1.37%	0.90%	1.35%	9.55%	14.25%
32	3.85%	5.69%	3.99%	5.99%	0.93%	1.39%	0.91%	1.37%	9.68%	14.44%
33	3.90%	5.77%	4.05%	6.07%	0.93%	1.40%	0.92%	1.38%	9.80%	14.62%
34	3.95%	5.84%	4.11%	6.16%	0.95%	1.43%	0.94%	1.41%	9.95%	14.84%
35	4.00%	5.93%	4.16%	6.24%	0.96%	1.44%	0.95%	1.42%	10.07%	15.03%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Entry Age	Basic Regular	Basic Regular	COLA Regular	COLA Regular	Basic Settlement	Basic Settlement	COLA Settlement	COLA Settlement	Combined	Combined
	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month	First \$350 per month	Over \$350 per month
36	4.06%	6.01%	4.23%	6.34%	0.97%	1.46%	0.96%	1.44%	10.22%	15.25%
37	4.12%	6.10%	4.29%	6.43%	0.99%	1.49%	0.98%	1.47%	10.38%	15.49%
38	4.18%	6.20%	4.36%	6.54%	1.01%	1.51%	0.99%	1.49%	10.54%	15.74%
39	4.25%	6.30%	4.43%	6.65%	1.03%	1.54%	1.01%	1.52%	10.72%	16.01%
40	4.33%	6.42%	4.52%	6.78%	1.04%	1.56%	1.03%	1.54%	10.92%	16.30%
41	4.42%	6.55%	4.61%	6.92%	1.06%	1.59%	1.05%	1.57%	11.14%	16.63%
42	4.46%	6.61%	4.66%	6.99%	1.08%	1.62%	1.07%	1.60%	11.27%	16.82%
43	4.50%	6.66%	4.69%	7.04%	1.09%	1.63%	1.07%	1.61%	11.35%	16.94%
44	4.52%	6.70%	4.72%	7.08%	1.09%	1.63%	1.07%	1.61%	11.40%	17.02%
45	4.50%	6.67%	4.70%	7.05%	1.09%	1.63%	1.07%	1.61%	11.36%	16.96%
46	4.47%	6.63%	4.67%	7.01%	1.08%	1.62%	1.07%	1.60%	11.29%	16.86%
47	4.45%	6.60%	4.65%	6.97%	1.07%	1.61%	1.06%	1.59%	11.23%	16.77%
48	4.39%	6.51%	4.58%	6.87%	1.05%	1.58%	1.04%	1.56%	11.06%	16.52%
49+	4.31%	6.38%	4.49%	6.73%	1.03%	1.55%	1.02%	1.53%	10.85%	16.19%

Interest:	7.00% per annum
COLA:	3.00%
Administrative Expenses:	0.16% of payroll added to Basic Regular rates
Mortality:	Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set back two years, weighted 80% male and 20% female
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See Exhibit II)
COLA Loading Factor:	108.29% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses, and 98.89% for Settlement Benefits

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association**Appendix A****Member Contribution Rates (Continued)****Safety Tier 2 Members' Contribution Rates based on the June 30, 2017
Actuarial Valuation as a percentage of payroll**

Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month	COLA Regular First \$350 per month	COLA Regular Over \$350 per month	Combined First \$350 per month	Combined Over \$350 per month
15	3.20%	4.71%	3.61%	5.41%	6.81%	10.12%
16	3.20%	4.71%	3.61%	5.41%	6.81%	10.12%
17	3.23%	4.77%	3.65%	5.48%	6.88%	10.25%
18	3.27%	4.82%	3.69%	5.54%	6.96%	10.36%
19	3.31%	4.88%	3.74%	5.61%	7.05%	10.49%
20	3.34%	4.93%	3.78%	5.67%	7.12%	10.60%
21	3.38%	4.99%	3.83%	5.74%	7.21%	10.73%
22	3.42%	5.05%	3.87%	5.81%	7.29%	10.86%
23	3.46%	5.11%	3.92%	5.88%	7.38%	10.99%
24	3.50%	5.17%	3.97%	5.95%	7.47%	11.12%
25	3.54%	5.23%	4.01%	6.02%	7.55%	11.25%
26	3.58%	5.29%	4.07%	6.10%	7.65%	11.39%
27	3.62%	5.35%	4.11%	6.17%	7.73%	11.52%
28	3.67%	5.42%	4.17%	6.25%	7.84%	11.67%
29	3.71%	5.48%	4.22%	6.33%	7.93%	11.81%
30	3.75%	5.55%	4.27%	6.41%	8.02%	11.96%
31	3.80%	5.62%	4.33%	6.49%	8.13%	12.11%
32	3.85%	5.69%	4.39%	6.58%	8.24%	12.27%
33	3.90%	5.77%	4.44%	6.66%	8.34%	12.43%
34	3.95%	5.84%	4.51%	6.76%	8.46%	12.60%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month	COLA Regular First \$350 per month	COLA Regular Over \$350 per month	Combined First \$350 per month	Combined Over \$350 per month
35	4.00%	5.93%	4.57%	6.85%	8.57%	12.78%
36	4.06%	6.01%	4.63%	6.95%	8.69%	12.96%
37	4.12%	6.10%	4.71%	7.06%	8.83%	13.16%
38	4.18%	6.20%	4.78%	7.17%	8.96%	13.37%
39	4.25%	6.30%	4.87%	7.30%	9.12%	13.60%
40	4.33%	6.42%	4.96%	7.44%	9.29%	13.86%
41	4.42%	6.55%	5.06%	7.59%	9.48%	14.14%
42	4.46%	6.61%	5.11%	7.67%	9.57%	14.28%
43	4.50%	6.66%	5.15%	7.73%	9.65%	14.39%
44	4.52%	6.70%	5.18%	7.77%	9.70%	14.47%
45	4.50%	6.67%	5.16%	7.74%	9.66%	14.41%
46	4.47%	6.63%	5.13%	7.69%	9.60%	14.32%
47	4.45%	6.60%	5.10%	7.65%	9.55%	14.25%
48	4.39%	6.51%	5.03%	7.54%	9.42%	14.05%
49+	4.31%	6.38%	4.93%	7.39%	9.24%	13.77%

Interest: 7.00% per annum

COLA: 3.00%

Administrative Expenses: 0.16% of payroll added to Basic Regular rates

Mortality: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set back two years weighted, 80% male and 20% female

Salary Increase: Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See Exhibit II)

COLA Loading Factor: 118.85% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association**Appendix A****Member Contribution Rates (Continued)****Safety Tier 4 Members' Contribution Rates based on the June 30, 2017
Actuarial Valuation as a percentage of payroll**

Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month	Entry Age	Basic Regular First \$350 per month	Basic Regular Over \$350 per month
15	5.95%	8.85%	33	7.13%	10.86%
16	5.79%	8.85%	34	7.23%	11.01%
17	5.86%	8.95%	35	7.33%	11.16%
18	5.93%	9.06%	36	7.44%	11.32%
19	6.00%	9.16%	37	7.56%	11.49%
20	6.07%	9.27%	38	7.68%	11.68%
21	6.15%	9.38%	39	7.81%	11.88%
22	6.22%	9.49%	40	7.93%	12.05%
23	6.29%	9.60%	41	8.01%	12.18%
24	6.37%	9.71%	42	8.06%	12.25%
25	6.45%	9.83%	43	8.07%	12.26%
26	6.53%	9.95%	44	8.04%	12.22%
27	6.61%	10.07%	45	7.99%	12.14%
28	6.69%	10.19%	46	7.90%	12.01%
29	6.77%	10.32%	47	7.77%	11.82%
30	6.86%	10.45%	48	8.03%	12.20%
31	6.95%	10.58%	49+	8.29%	12.60%
32	7.04%	10.72%			

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Interest:	7.00% per annum
COLA:	0.00%
Administrative Expenses:	0.16% of payroll added to Basic Regular rates
Mortality:	Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set back two years weighted, 80% male and 20% female
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See Exhibit II)

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix A
Member Contribution Rates (Continued)

**Safety Tier 5 Members' Contribution Rates based on the June 30, 2017
Actuarial Valuation as a percentage of payroll**

	All Eligible Pay ⁽¹⁾
All members	12.07%
Administrative Expenses:	0.16% of payroll added to the rate

⁽¹⁾ It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2017 is \$118,775. For an employer that is not enrolled in Social Security, the maximum amount is \$142,530 (reference Section 7522.10). These amounts are adjusted for changes to the Consumer Price Index for All Urban Consumers after 2017 (reference Section 7522.10(d)).

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix B

Amortization Schedule for UAAL

General – Regular Benefits	Source	Initial Amount	Outstanding Balance	Years Remaining	Payment
June 30, 2003	Restart Amortization	N/A ⁽¹⁾	\$60,912,888	16	\$5,008,623
June 30, 2004	Actuarial Loss/POB Proceeds ⁽²⁾	N/A ⁽¹⁾	(13,160,190)	2	(6,938,894)
June 30, 2005	Actuarial Loss	\$165,807,070	63,998,420	3	22,867,979
June 30, 2006	Actuarial Loss	74,355,835	36,113,798	4	9,837,290
June 30, 2006	Plan Provision Change	333,000	378,192	19	27,394
June 30, 2007	Actuarial Loss	9,736,697	5,601,070	5	1,240,519
June 30, 2007	Assumption Change	48,705,000	28,017,722	5	6,205,337
June 30, 2008	Actuarial Loss	37,435,443	24,402,971	6	4,577,168
June 30, 2009	Actuarial Loss	99,661,060	71,581,772	7	11,694,171
June 30, 2010	Actuarial Loss	40,450,188	31,362,529	8	4,555,219
June 30, 2010	Assumption Change	180,478,000	139,931,282	8	20,324,179
June 30, 2011	Actuarial Loss	33,654,586	27,756,792	9	3,640,803
June 30, 2012	Actuarial Gain	(37,654,021)	(32,630,286)	10	(3,913,220)
June 30, 2013	Actuarial Gain	(55,328,951)	(49,880,035)	11	(5,523,964)
June 30, 2013	Assumption Change	152,395,000	137,386,810	11	15,214,902
June 30, 2014	Actuarial Gain	(35,957,667)	(33,559,735)	12	(3,460,311)
June 30, 2015	Actuarial Loss	1,049,334	1,006,947	13	97,334
June 30, 2016	Actuarial Loss	26,665,072	26,155,523	14	2,384,076
June 30, 2016	Assumption Change	146,934,000	144,126,208	14	13,137,104
June 30, 2017	Actuarial Gain	(1,695,678)	(1,695,678)	15	(146,482)
	Total		\$667,807,000		\$100,829,227

⁽¹⁾ The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

⁽²⁾ It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial loss in the June 30, 2004 valuation.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix B (continued)

Amortization Schedule for UAAL

General – Settlement Benefits	Source	Initial Amount	Outstanding Balance	Years Remaining	Payment
June 30, 2003	Restart Amortization ⁽¹⁾	N/A ⁽²⁾	\$141,506,237	16	\$11,635,493
June 30, 2004	Actuarial Loss/POB Proceeds ⁽³⁾	N/A ⁽²⁾	(14,652,578)	2	(7,725,777)
June 30, 2005	Actuarial Loss	\$10,771,055	4,157,426	3	1,485,536
June 30, 2006	Actuarial Loss	8,282,685	4,022,808	4	1,095,801
June 30, 2007	Actuarial Gain	(162,430)	(93,438)	5	(20,695)
June 30, 2007	Assumption Change	37,063,000	21,320,623	5	4,722,070
June 30, 2008	Actuarial Loss	11,510,769	7,503,503	6	1,407,402
June 30, 2009	Actuarial Loss	17,637,452	12,668,138	7	2,069,568
June 30, 2010	Actuarial Loss	4,210,394	3,264,475	8	474,145
June 30, 2010	Assumption Change	38,322,000	29,712,467	8	4,315,558
June 30, 2011	Actuarial Loss	208,522	171,980	9	22,558
June 30, 2012	Actuarial Gain	(18,843,015)	(16,329,013)	10	(1,958,273)
June 30, 2013	Actuarial Gain	(20,059,381)	(18,083,889)	11	(2,002,700)
June 30, 2013	Assumption Change	41,809,000	37,691,559	11	4,174,152
June 30, 2014	Actuarial Gain	(16,375,093)	(15,283,078)	12	(1,575,823)
June 30, 2015	Actuarial Gain	(16,849,948)	(16,169,307)	13	(1,562,974)
June 30, 2016	Actuarial Gain	(2,623,929)	(2,573,788)	14	(234,601)
June 30, 2016	Assumption Change	25,697,000	25,205,951	14	2,297,522
June 30, 2017	Actuarial Gain	(8,885,007)	(8,887,007)	15	(767,704)
	Total		\$195,153,069		\$17,851,258

⁽¹⁾ The outstanding balance includes the full General Section 8 UAAL and General Section 9 UAAL.

⁽²⁾ The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

⁽³⁾ It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial losses in the June 30, 2004 valuation.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix B (continued)

Amortization Schedule for UAAL

Safety – Regular Benefits	Source	Initial Amount	Outstanding Balance	Years Remaining	Payment
June 30, 2003	Restart Amortization	N/A ⁽¹⁾	\$20,839,527	16	\$1,713,551
June 30, 2004	Actuarial Loss/POB Proceeds ⁽²⁾	N/A ⁽¹⁾	(2,843,861)	2	(1,499,466)
June 30, 2005	Actuarial Loss	\$28,456,160	10,983,543	3	3,924,650
June 30, 2006	Actuarial Loss	36,122,657	17,544,371	4	4,779,034
June 30, 2007	Actuarial Loss	11,440,206	6,581,018	5	1,457,557
June 30, 2007	Assumption Change	18,663,000	10,735,956	5	2,377,789
June 30, 2008	Actuarial Loss	25,279,442	16,478,862	6	3,090,874
June 30, 2009	Actuarial Loss	33,290,245	23,910,790	7	3,906,258
June 30, 2010	Actuarial Loss	7,016,461	5,440,121	8	790,145
June 30, 2010	Assumption Change	44,211,000	34,278,426	8	4,978,736
June 30, 2011	Actuarial Gain	(3,902,219)	(3,218,373)	9	(422,147)
June 30, 2012	Actuarial Gain	(4,727,978)	(4,097,179)	10	(491,359)
June 30, 2013	Actuarial Gain	(17,551,239)	(15,822,754)	11	(1,752,291)
June 30, 2013	Assumption Change	47,490,000	42,813,082	11	4,741,335
June 30, 2014	Actuarial Gain	(11,045,503)	(10,308,905)	12	(1,062,941)
June 30, 2015	Actuarial Gain	(375,371)	(360,209)	13	(34,819)
June 30, 2016	Actuarial Gain	(3,837,802)	(3,764,465)	14	(343,131)
June 30, 2016	Assumption Change	51,927,000	50,934,717	14	4,642,699
June 30, 2017	Actuarial Loss	1,282,333	1,282,333	15	110,775
	Total		\$201,407,000		\$30,907,249

⁽¹⁾ The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

⁽²⁾ It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial loss in the June 30, 2004 valuation.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix B (continued)

Amortization Schedule for UAAL

Safety – Settlement Benefits	Source	Initial Amount	Outstanding Balance	Years Remaining	Payment
June 30, 2003	Restart Amortization ⁽¹⁾	N/A ⁽²⁾	\$24,090,067	16	\$1,980,829
June 30, 2004	Actuarial Loss/POB Proceeds ⁽³⁾	N/A ⁽²⁾	(2,328,941)	2	(1,227,967)
June 30, 2005	Actuarial Gain	\$(8,133,004)	(3,139,186)	3	(1,121,697)
June 30, 2006	Actuarial Loss	6,885,605	3,344,263	4	910,967
June 30, 2007	Actuarial Loss	810,988	466,524	5	103,325
June 30, 2007	Assumption Change	4,474,000	2,573,684	5	570,017
June 30, 2008	Actuarial Loss	4,845,166	3,158,409	6	592,410
June 30, 2009	Actuarial Loss	7,849,312	5,637,786	7	921,034
June 30, 2010	Actuarial Loss	1,272,629	986,717	8	143,315
June 30, 2010	Assumption Change	6,935,000	5,376,963	8	780,972
June 30, 2011	Actuarial Gain	(433,930)	(357,886)	9	(46,943)
June 30, 2012	Actuarial Gain	(1,098,338)	(951,800)	10	(114,146)
June 30, 2013	Actuarial Gain	(3,609,401)	(3,253,938)	11	(360,357)
June 30, 2013	Assumption Change	10,467,000	9,436,187	11	1,045,011
June 30, 2014	Actuarial Gain	(2,617,021)	(2,442,498)	12	(251,844)
June 30, 2015	Actuarial Gain	(7,407,553)	(7,108,330)	13	(687,113)
June 30, 2016	Actuarial Loss	5,491,129	5,386,198	14	490,952
June 30, 2016	Assumption Change	9,148,000	8,973,189	14	817,906
June 30, 2017	Actuarial Gain	(278,477)	(278,477)	15	(24,056)
	Total		\$49,568,931		\$4,522,615

⁽¹⁾ The outstanding balance includes the full Safety Section 8 UAAL and Safety Section 9 UAAL.

⁽²⁾ The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

⁽³⁾ It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial losses in the June 30, 2004 valuation.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix B (continued)

Amortization Schedule for UAAL

Total	Source	Initial Amount	Outstanding Balance	Years Remaining	Payment
June 30, 2003	Restart Amortization ⁽¹⁾	N/A ⁽²⁾	\$247,348,719	16	\$20,338,496
June 30, 2004	Actuarial Loss/POB Proceeds ⁽³⁾	N/A ⁽²⁾	(32,985,570)	2	(17,392,104)
June 30, 2005	Actuarial Loss	\$196,901,281	76,000,203	3	27,156,468
June 30, 2006	Actuarial Loss	125,646,782	61,025,240	4	16,623,092
June 30, 2006	Plan Provision Change	333,000	378,192	19	27,394
June 30, 2007	Actuarial Loss	21,825,461	12,555,174	5	2,780,706
June 30, 2007	Assumption Change	108,905,000	62,647,985	5	13,875,213
June 30, 2008	Actuarial Loss	79,070,820	51,543,745	6	9,667,854
June 30, 2009	Actuarial Loss	158,438,069	113,798,486	7	18,591,031
June 30, 2010	Actuarial Loss	52,949,672	41,053,842	8	5,962,824
June 30, 2010	Assumption Change	269,946,000	209,299,138	8	30,399,445
June 30, 2011	Actuarial Loss	29,526,959	24,352,513	9	3,194,271
June 30, 2012	Actuarial Gain	(62,323,352)	(54,008,278)	10	(6,476,998)
June 30, 2013	Actuarial Gain	(96,548,872)	(87,040,616)	11	(9,639,312)
June 30, 2013	Assumption Change	252,161,000	227,327,638	11	25,175,400
June 30, 2014	Actuarial Gain	(65,995,284)	(61,594,216)	12	(6,350,919)
June 30, 2015	Actuarial Gain	(23,583,538)	(22,630,899)	13	(2,187,572)
June 30, 2016	Actuarial Loss	25,694,470	25,203,468	14	2,297,296
June 30, 2016	Assumption Change	233,706,000	229,240,065	14	20,895,231
June 30, 2017	Actuarial Gain	(9,578,829)	(9,578,829)	15	(827,467)
	Total		\$1,113,936,000		\$154,110,349

⁽¹⁾ The outstanding balance includes the full Section 8 UAAL and Section 9 UAAL.

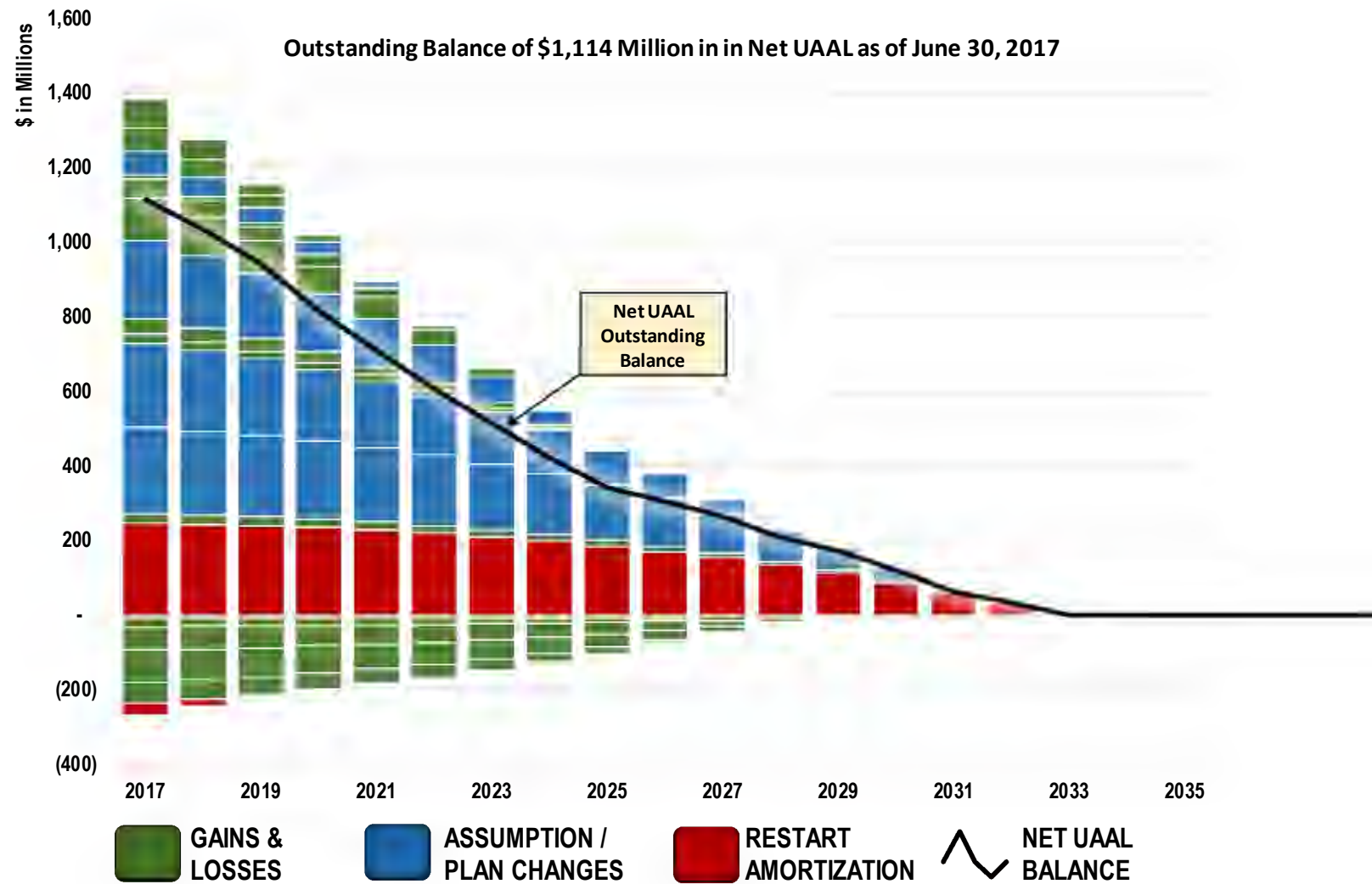
⁽²⁾ The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

⁽³⁾ It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial losses in the June 30, 2004 valuation.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix C

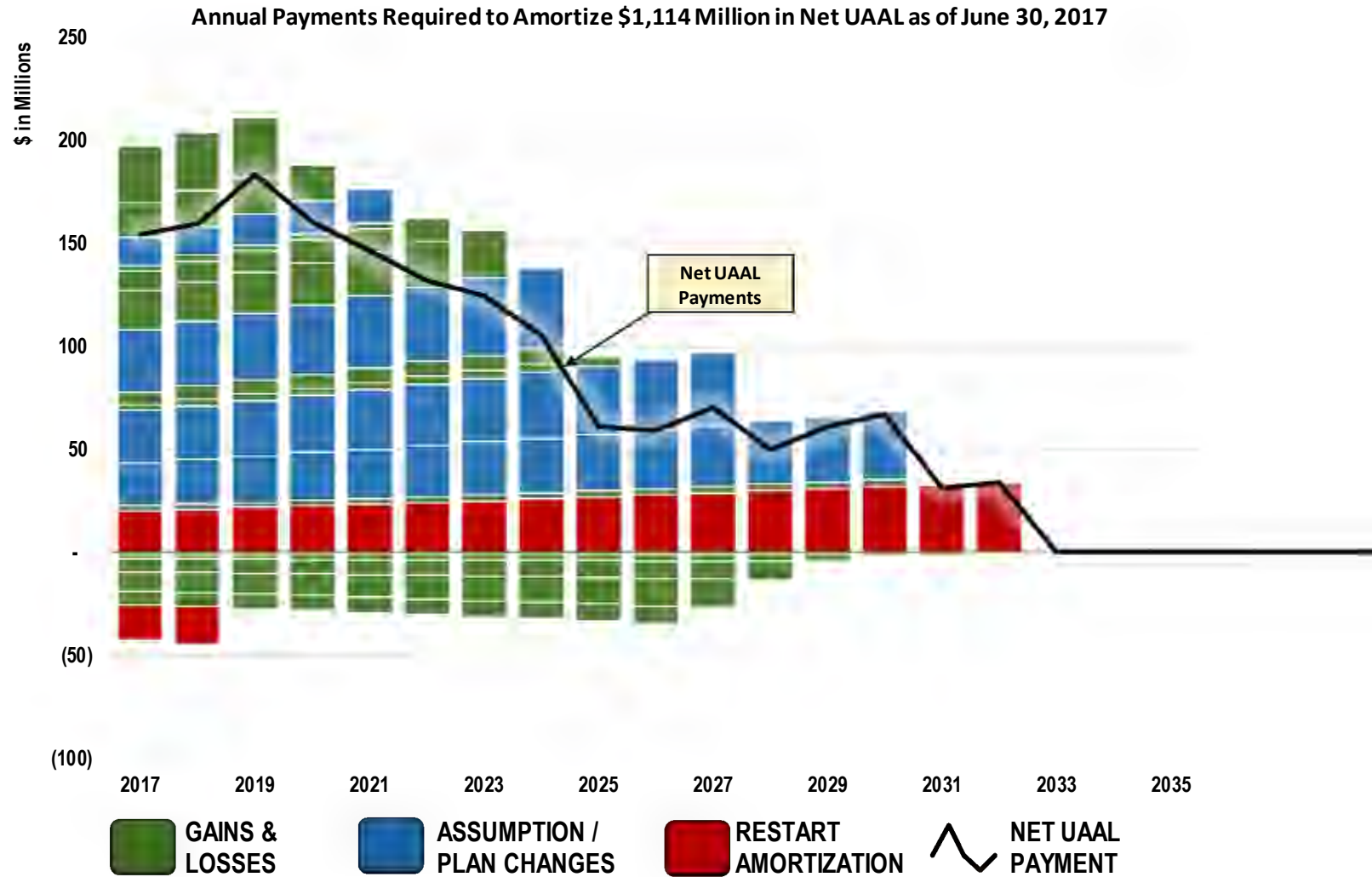
Projection of UAAL Balances and Payments



SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix C (continued)

Projection of UAAL Balances and Payments



SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix D

Schedule of UAAL and Associated Funded Ratios (Dollar Amounts in Thousands)

	Regular Benefit	Settlement Benefit	Total
A. AAL	\$4,441,416	\$1,202,028	\$5,643,444
B. Valuation Value of Assets	\$3,572,202	\$957,306	\$4,529,508
C. UAAL (A - B)	\$869,214	\$244,722	\$1,113,936
D. Funded Ratio (B / A)	80.43%	79.64%	80.26%

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix E

Recommended Employer Contribution Rates with Three-Year Phase-in of Cost Impact of 2016 Changes in Actuarial Assumptions (Dollar Amounts in Thousands)

	June 30, 2017 ⁽¹⁾						June 30, 2016 ⁽¹⁾	
	REGULAR		SETTLEMENT		TOTAL		REGULAR & SETTLEMENT	
	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
General Tier 1 Members								
Normal Cost	16.07%	\$31,607	5.06%	\$9,952	21.13%	\$41,559	21.37%	\$42,031
UAAL	<u>28.61%</u>	<u>56,271</u>	<u>4.91%</u>	<u>9,657</u>	<u>33.52%</u>	<u>65,928</u>	<u>31.84%</u>	<u>62,624</u>
Total Contribution	44.68%	\$87,878	9.97%	\$19,609	54.65%	\$107,487	53.21%	\$104,655
General Tier 2 Members								
Normal Cost	18.07%	\$1,661	0.26%	\$24	18.33%	\$1,685	18.33%	\$1,685
UAAL	<u>28.56%</u>	<u>2,624</u>	<u>4.90%</u>	<u>451</u>	<u>33.46%</u>	<u>3,075</u>	<u>31.73%</u>	<u>2,916</u>
Total Contribution	46.63%	\$4,285	5.16%	\$475	51.79%	\$4,760	50.06%	\$4,601
General Tier 3 Members								
Normal Cost	17.60%	\$5,799	0.32%	\$105	17.92%	\$5,904	17.87%	\$5,888
UAAL	<u>28.61%</u>	<u>9,426</u>	<u>4.90%</u>	<u>1,615</u>	<u>33.51%</u>	<u>11,041</u>	<u>31.83%</u>	<u>10,487</u>
Total Contribution	46.21%	\$15,225	5.22%	\$1,720	51.43%	\$16,945	49.70%	\$16,375
General Tier 4 Members								
Normal Cost	8.84%	\$1,218	0.00%	\$0	8.84%	\$1,218	8.76%	\$1,207
UAAL	<u>28.68%</u>	<u>3,952</u>	<u>4.91%</u>	<u>677</u>	<u>33.59%</u>	<u>4,629</u>	<u>31.98%</u>	<u>4,407</u>
Total Contribution	37.52%	\$5,170	4.91%	\$677	42.43%	\$5,847	40.74%	\$5,614
General Tier 5 Members								
Normal Cost	7.23%	\$6,666	0.00%	\$0	7.23%	\$6,666	7.26%	\$6,694
UAAL	<u>28.68%</u>	<u>26,444</u>	<u>4.90%</u>	<u>4,519</u>	<u>33.58%</u>	<u>30,963</u>	<u>31.98%</u>	<u>29,487</u>
Total Contribution	35.91%	\$33,110	4.90%	\$4,519	40.81%	\$37,629	39.24%	\$36,181

⁽¹⁾ The Regular Normal Cost and UAAL rates shown for each cost group include an explicit administrative expense of 0.16% and 0.78% of payroll, respectively.

⁽²⁾ Amounts are in thousands and are based on June 30, 2017 projected annual compensation shown on the following page.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix E (continued)

Recommended Employer Contribution Rates with Three-Year Phase-in of Cost Impact of 2016 Changes in Actuarial Assumptions (Dollar Amounts in Thousands)

	June 30, 2017 ⁽¹⁾						June 30, 2016 ⁽¹⁾	
	REGULAR		SETTLEMENT		TOTAL		REGULAR & SETTLEMENT	
	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Safety Tier 1 Members								
Normal Cost	23.84%	\$10,656	5.75%	\$2,571	29.59%	\$13,227	29.67%	\$13,263
UAAL	<u>43.25%</u>	<u>19,334</u>	<u>6.11%</u>	<u>2,731</u>	<u>49.36%</u>	<u>22,065</u>	<u>46.36%</u>	<u>20,724</u>
Total Contribution	67.09%	\$29,990	11.86%	\$5,302	78.95%	\$35,292	76.03%	\$33,987
Safety Tier 2 Members								
Normal Cost	29.45%	\$1,362	0.25%	\$12	29.70%	\$1,374	29.84%	\$1,380
UAAL	<u>43.28%</u>	<u>2,002</u>	<u>6.10%</u>	<u>282</u>	<u>49.38%</u>	<u>2,284</u>	<u>46.40%</u>	<u>2,146</u>
Total Contribution	72.73%	\$3,364	6.35%	\$294	79.08%	\$3,658	76.24%	\$3,526
Safety Tier 4 Members								
Normal Cost	14.23%	\$576	0.20%	\$8	14.43%	\$584	14.19%	\$575
UAAL	<u>43.41%</u>	<u>1,758</u>	<u>6.10%</u>	<u>247</u>	<u>49.51%</u>	<u>2,005</u>	<u>46.67%</u>	<u>1,890</u>
Total Contribution	57.64%	\$2,334	6.30%	\$255	63.94%	\$2,589	60.86%	\$2,465
Safety Tier 5 Members								
Normal Cost	12.07%	\$1,880	0.00%	\$0	12.07%	\$1,880	12.03%	\$1,874
UAAL	<u>43.30%</u>	<u>6,743</u>	<u>6.11%</u>	<u>952</u>	<u>49.41%</u>	<u>7,695</u>	<u>46.46%</u>	<u>7,236</u>
Total Contribution	55.37%	\$8,623	6.11%	\$952	61.48%	\$9,575	58.49%	\$9,110
All Categories Combined								
Normal Cost	14.85%	\$61,425	3.06%	\$12,672	17.91%	\$74,097	18.03%	\$74,597
UAAL	<u>31.07%</u>	<u>128,554</u>	<u>5.11%</u>	<u>21,131</u>	<u>36.18%</u>	<u>149,685</u>	<u>34.30%</u>	<u>141,917</u>
Total Contribution	45.92%	\$189,979	8.17%	\$33,803	54.09%	\$223,782	52.33%	\$216,514

⁽¹⁾ The Regular Normal Cost and UAAL rates shown for each cost group include an explicit administrative expense of 0.16% and 0.78% of payroll, respectively.

⁽²⁾ Amounts are in thousands and are based on June 30, 2017 projected annual compensation (also in thousands):

General Tier 1	\$196,683	Safety Tier 1	\$44,702
General Tier 2	9,191	Safety Tier 2	4,626
General Tier 3	32,947		
General Tier 4	13,782	Safety Tier 4	4,049
General Tier 5	92,206	Safety Tier 5	15,574
Total Compensation		\$413,760	

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix F

Breakdown of Employer Contribution Rate Into Basic and COLA with Three-Year Phase-in of Cost Impact of 2016 Changes in Actuarial Assumptions

	General									
	June 30, 2017					June 30, 2016				
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Normal Cost										
Regular - Basic	12.67%	14.68%	14.08%	8.68%	7.07%	12.81%	14.70%	14.06%	8.60%	7.10%
Regular - COLA	3.24%	3.23%	3.36%	0.00%	0.00%	3.28%	3.22%	3.33%	0.00%	0.00%
Section 6	4.68%	0.00%	0.00%	0.00%	0.00%	4.73%	0.00%	0.00%	0.00%	0.00%
Section 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Section 9	0.38%	0.26%	0.32%	0.00%	0.00%	0.39%	0.25%	0.32%	0.00%	0.00%
Administrative Expense	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
Subtotal	21.13%	18.33%	17.92%	8.84%	7.23%	21.37%	18.33%	17.87%	8.76%	7.26%
UAAL										
Regular – Basic	18.27%	18.23%	18.25%	18.28%	18.27%	17.25%	17.18%	17.23%	17.28%	17.27%
Regular – COLA	9.57%	9.55%	9.58%	9.63%	9.63%	8.99%	8.95%	8.99%	9.10%	9.10%
Section 6	3.98%	3.98%	3.98%	3.98%	3.98%	3.95%	3.95%	3.95%	3.95%	3.95%
Section 8	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%	0.00%	0.00%	0.00%	0.00%	0.00%
Section 9	0.98%	0.98%	0.98%	0.98%	0.98%	0.87%	0.87%	0.88%	0.87%	0.88%
Administrative Expense	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%
Subtotal	33.52%	33.46%	33.51%	33.59%	33.58%	31.84%	31.73%	31.83%	31.98%	31.98%
Total	54.65%	51.79%	51.43%	42.43%	40.81%	53.21%	50.06%	49.70%	40.74%	39.24%

Note: Please refer to Section 4, Exhibit III for definition of Regular and Settlement Sections 6, 8 and 9 benefits.

SECTION 4: Reporting Information for the Fresno County Employees' Retirement Association

Appendix F (continued)

Breakdown of Employer Contribution Rate Into Basic and COLA with Three-Year Phase-in of Cost Impact of 2016 Changes in Actuarial Assumptions

	Safety							
	June 30, 2017				June 30, 2016			
	Tier 1	Tier 2	Tier 4	Tier 5	Tier 1	Tier 2	Tier 4	Tier 5
Normal Cost								
Regular - Basic	18.71%	23.18%	14.07%	11.91%	18.73%	23.27%	13.84%	11.87%
Regular - COLA	4.97%	6.11%	0.00%	0.00%	5.02%	6.16%	0.00%	0.00%
Section 6	5.43%	0.00%	0.00%	0.00%	5.43%	0.00%	0.00%	0.00%
Section 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Section 9	0.32%	0.25%	0.20%	0.00%	0.33%	0.25%	0.19%	0.00%
Administrative Expense	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
Subtotal	29.59%	29.70%	14.43%	12.07%	29.67%	29.84%	14.19%	12.03%
UAAL								
Regular – Basic	19.91%	19.95%	19.98%	19.88%	18.96%	19.06%	19.11%	18.91%
Regular – COLA	22.56%	22.54%	22.64%	22.64%	20.91%	20.88%	21.08%	21.08%
Section 6	5.19%	5.19%	5.19%	5.19%	4.84%	4.82%	4.82%	4.82%
Section 8	-0.06%	-0.06%	-0.06%	-0.06%	0.00%	0.00%	0.00%	0.00%
Section 9	0.98%	0.98%	0.98%	0.98%	0.87%	0.86%	0.88%	0.87%
Administrative Expense	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%	0.78%
Subtotal	49.36%	49.38%	49.51%	49.41%	46.36%	46.40%	46.67%	46.46%
Total	78.95%	79.08%	63.94%	61.48%	76.03%	76.24%	60.86%	58.49%

Note: Please refer to Section 4, Exhibit III for definition of Regular and Settlement Sections 6, 8 and 9 benefits.

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Fresno County Employees' Retirement Association

**Governmental Accounting Standards (GAS) 67
Actuarial Valuation as of June 30, 2017**

This report has been prepared at the request of the Board of Retirement to assist FCERA in administering the Fund. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Retirement and may only be provided to other parties in its entirety. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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December 4, 2017

*Board of Retirement
Fresno County Employees' Retirement Association
7772 N Palm Ave
Fresno, CA 93711*

Dear Board Members:

We are pleased to submit this Governmental Accounting Standards (GAS) 67 Actuarial Valuation as of June 30, 2017. It contains various information that will need to be disclosed in order to comply with GAS 67.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Association. The census and financial information on which our calculations were based was prepared by FCERA. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. 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; and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of Andy Yeung, ASA, MAAA, FCA, EA. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and expectations for the Plan.

We look forward to reviewing this report with you and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By:

*Paul Angelo, FSA, MAAA, FCA, EA
Senior Vice President and Actuary*

*Andy Yeung, ASA, MAAA, FCA, EA
Vice President and Actuary*

AW/bbf

SECTION 1

VALUATION SUMMARY

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SECTION 2

GAS 67 INFORMATION

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SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Purpose

This report has been prepared by Segal Consulting to present certain disclosure information required by Governmental Accounting Standards (GAS) 67 as of June 30, 2017. This valuation is based on:

- The benefit provisions of FCERA, as administered by the Board of Retirement;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of June 30, 2016, provided by FCERA;
- The assets of the Plan as of June 30, 2017, provided by FCERA;
- Economic assumptions regarding future salary increases and investment earnings as of June 30, 2017; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc., as of June 30, 2017.

General Observations on GAS 67 Actuarial Valuation

The following points should be considered when reviewing this GAS 67 report:

- The Governmental Accounting Standards Board (GASB) rules only define pension liability and expense for financial reporting purposes, and do not apply to contribution amounts for pension funding purposes. Employers and plans develop and adopt funding policies under current practices.
- When measuring pension liability GASB uses the same actuarial cost method (Entry Age method) and the same type of discount rate (expected return on assets) as FCERA uses for funding. This means that the Total Pension Liability (TPL) measure for financial reporting shown in this report is determined on generally the same basis as FCERA's Actuarial Accrued Liability (AAL) measure for funding. We note that the same is generally true for the Normal Cost component of the annual plan cost for funding and financial reporting.
- The Net Pension Liability (NPL) is equal to the difference between the TPL and the Plan Fiduciary Net Position. The Plan Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) calculated on a market value basis.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

- The NPL's measured as of June 30, 2017 and June 30, 2016 have been determined by rolling forward the TPL as of June 30, 2016 and June 30, 2015, respectively. In our reporting as of June 30, 2016, we adjusted the TPL to include \$0.2¹ million that was set aside by the Retirement Board to pay non-vested Supplemental COLA and Retiree Health benefits from funds set aside in those two reserve accounts. We have not made a similar adjustment in our reporting as of June 30, 2017 as there was a \$0 balance in the two reserve accounts.
- The NPL decreased from \$1,533.0 million as of June 30, 2016 to \$1,306.3 million as of June 30, 2017 primarily due to the 10.4% return on the market value of assets during 2016/2017 that was more than the assumed return of 7.00% (a gain of \$137.6 million). There were also actuarial gains from lower than expected salary increases for actives members and lower than expected COLA increases for retirees and beneficiaries during 2015/2016 (because liabilities are rolled forward from June 30, 2015 to June 30, 2016, those changes are not reflected until this valuation as of June 30, 2017). Changes in these values during the last two fiscal years ending June 30, 2017 and June 30, 2016 can be found in Exhibit 3.
- The discount rate used to determine the TPL and NPL as of June 30, 2017 was 7.00%, following the same assumption used by the Association in the pension funding valuation as of June 30, 2016. The detailed calculations of the discount rate of 7.00% used in calculation of the TPL and NPL as of June 30, 2017 can be found in Exhibit 5 of Section 2. Various other information that is required to be disclosed can be found throughout Exhibits 1 through 4 in Section 2.

¹ The balance in the Supplemental COLA Reserve was \$0.2 million and the balance in the Retiree Health Reserve was \$0 (after limiting that balance to be no less than \$0).

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Summary of Key Valuation Results

	2017	2016
Disclosure elements for plan year ending June 30:		
Service Cost ⁽¹⁾⁽²⁾	\$109,231,556	\$105,592,251
Total Pension Liability	5,713,538,731	5,542,506,355
Plan Fiduciary Net Position	4,407,221,766	4,009,495,932
Net Pension Liability	1,306,316,965	1,533,010,423
Schedule of contributions for plan year ending June 30:		
Actuarially determined contributions	\$198,472,000	\$191,529,000
Actual contributions	198,472,000	191,529,000
Contribution deficiency (excess)	0	0
Demographic data for plan year ending June 30:⁽³⁾		
Number of retired members and beneficiaries	7,200	7,032
Number of vested terminated members	3,411	3,289
Number of active members	7,353	7,297
Key assumptions as of June 30:		
Investment rate of return	7.00%	7.00%
Inflation rate	3.00%	3.00%
Projected salary increases ⁽⁴⁾	General: 4.50% to 11.50% and Safety: 4.90% to 11.50%	General: 4.50% to 11.50% and Safety: 4.90% to 11.50%

⁽¹⁾ The service cost is based on the previous year's valuation, meaning the 2017 and 2016 values are based on the valuations as of June 30, 2016 and June 30, 2015, respectively. The 2017 service cost has been calculated using the assumptions shown in the 2016 column and the 2016 service cost has been calculated using the assumptions used in the 2015 valuation. The key assumptions as of June 30, 2015 are as follows:

Key assumptions as of June 30, 2015:

Investment rate of return	7.25%
Inflation rate	3.25%
Projected salary increases*	General: 4.75% to 10.75% and Safety: 5.25% to 10.75%

* Includes inflation at 3.25% plus real across-the-board salary increases of 0.50% plus merit and promotional increases.

⁽²⁾ Excludes administrative expense load.

⁽³⁾ Data as of June 30, 2016 is used in the measurement of the TPL as of June 30, 2017.

⁽⁴⁾ Includes inflation at 3.00% plus real across-the-board salary increases of 0.50% plus merit and promotional increases.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

Important Information about Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare an actuarial valuation, Segal Consulting (“Segal”) relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan description in this report (as well as the plan summary included in our funding valuation report) to confirm that Segal has correctly interpreted the plan of benefits.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by FCERA. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** This valuation is based on the market value of assets as of the valuation date, as provided by FCERA.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal’s actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The valuation is prepared at the request of the Board to assist FCERA in preparing items related to the pension plan in their financial reports. Segal is not responsible for the use or misuse of its report, particularly by any other party.

SECTION 1: Valuation Summary for the Fresno County Employees' Retirement Association

- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- If FCERA is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of FCERA, it is not a fiduciary in its capacity as actuaries and consultants with respect to FCERA.

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

EXHIBIT 1

General Information – “Financial Statements”, Note Disclosures and Required Supplementary Information for a Cost-Sharing Pension Plan

Plan Description

Plan administration. The Fresno County Employees' Retirement Association (FCERA) was established by the County of Board of Supervisors on January 1, 1945. FCERA is administered by the Board of Retirement and governed by the County Employees' Retirement Law of 1937 (California Government Code Section 31450 et seq.). FCERA is a cost-sharing multiple employer defined benefit public employee retirement system whose main function is to provide service retirement, disability, death and survivor benefits to the General and Safety members employed by the County of Fresno. FCERA also provides retirement benefits to the employee members of the Superior Court County of Fresno, Clovis Veterans Memorial District, Fresno-Madera Area Agency on Aging and Fresno Mosquito and Vector Control District.

The management of FCERA is vested with the FCERA Board of Retirement. The Board consists of nine members and two alternates. The County Treasurer is elected by the general public and a member of the Board of Retirement by law. Four members are appointed by the Board of Supervisors, one of whom may be a County Supervisor. Two active members are elected by the General members; one active member and one alternate are elected by the Safety members; one retired member and one alternate are elected by the retired members. All members of the Board of Retirement serve terms of three years except for the County Treasurer whose term runs concurrent with his term as County Treasurer.

Plan membership. At June 30, 2017, pension plan membership consisted of the following:

Retired members or beneficiaries currently receiving benefits	7,200
Vested terminated members entitled to, but not yet receiving benefits ⁽¹⁾	3,411
Active members	<u>7,353</u>
Total	17,964

⁽¹⁾ Includes terminated members due a refund of member contributions.

Benefits provided. FCERA provides service retirement, disability, death and survivor benefits to eligible employees. All regular full-time employees and permanent part-time employees who work 50% or more for the County of Fresno or the other participating agencies become members of FCERA effective on the first day of the first full pay period after employment in a permanent position. There are separate retirement benefits for General and Safety members. Safety membership is extended to

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

those involved in active law enforcement, fire suppression, and district attorney investigators. All other employees are classified as General members. The tiers and their basic provisions are listed below:

<u>Tier Name</u>	<u>Governing Code</u>	<u>Effective Date</u>	<u>Basic Provisions</u>	<u>Final Average Salary Period</u>	<u>Plan Sponsors</u>
Pre-Ventura General	§31676.12	Various	2.0% at 57; maximum 3% COLA	Highest 1-year	All
General Tier 1	§31676.14 and the Settlement Agreement	January 1, 2001	2.5% at 55; maximum 3% COLA	Highest 1-year	All
General Tier 2	§31676.16	February 26, 2006	2.0% at 55; maximum 3% COLA	Highest 1-year	County and FMAAA
General Tier 3	§31676.15	December 17, 2007	2.0% at 55; maximum 3% COLA	Highest 3-years	County
General Tier 4	§31676.1	June 11, 2012	2.0% at 61; no COLA	Highest 3-years	County
General Tier 5	§7522.20(a)	January 1, 2013	2.5% at 67; no COLA	Highest 3-years	All
Pre-Ventura Safety	§31664	Various	2.0% at 50; maximum 3% COLA	Highest 1-year	All
Safety Tier 1	§31664 and the Settlement Agreement	January 1, 2001	2.5% at 50; maximum 3% COLA	Highest 1-year	County and NCFPD
Safety Tier 2	§31664.2	February 26, 2006	3.0% at 55; maximum 3% COLA	Highest 1-year	County
Safety Tier 4	§31664	June 11, 2012	2.0% at 50; no COLA	Highest 3-years	County
Safety Tier 5	§7522.25(d)	January 1, 2013	2.7% at 57; no COLA	Highest 3-years	All

Note: FMAAA – Fresno-Madera Area Agency on Aging

NCFPD – North Central Fire Protection District (NCFPD withdrew active membership from FCERA as of August 31, 2007)

There is no Safety Tier 3 offered by FCERA

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

Any new member who becomes a member on or after January 1, 2013 is placed into Tier 5 and is subject to the provisions of California Public Employees' Pension Reform Act of 2013 (PEPRA) and California Government Code 7522 et seq.

General members enrolled in Tiers 1, 2, 3, or 4 are eligible to retire once they attain the age of 70 regardless of service or at age 50 and have acquired 10 or more years of retirement service credit. A member with 30 years of service is eligible to retire regardless of age. General members enrolled in General Tier 5 are eligible to retire once they attain the age of 70 regardless of service or at age 52 and have acquired five years of retirement service credit.

Safety members enrolled in Tiers 1, 2, or 4 are eligible to retire once they attain the age of 70 regardless of service or at age 50 and have acquired 10 or more years of retirement service credit. A member with 20 years of service is eligible to retire regardless of age. Safety members enrolled in Safety Tier 5 are eligible to retire once they attain the age of 70 regardless of service or at age 50 and have acquired five years of retirement service credit.

The retirement benefit the member will receive is based upon age at retirement, final average compensation, years of retirement service credit and retirement plan and tier.

For members enrolled in Tier 1, 2, 3, or 4, the maximum monthly retirement allowance is 100% of final compensation. There is no maximum for members enrolled in Tier 5. However, for members with membership dates on or after January 1, 2013 the maximum amount of pensionable compensation that can be taken into account for 2017 is equal to \$118,775 for those enrolled in Social Security (\$142,530 for those not enrolled in Social Security). This limit is adjusted on an annual basis. Members are exempt from paying member contributions and employers are exempt from paying employer contributions on compensation in excess of the annual cap.

The member may elect an unmodified retirement allowance, or choose an optional retirement allowance. The unmodified retirement allowance provides the highest monthly benefit and a 60% continuance to an eligible surviving spouse or domestic partner. An eligible surviving spouse or domestic partner is one married to or registered with the member one year prior to the effective retirement date. Certain surviving spouses or domestic partners may also be eligible if marriage or domestic partnership was at least two years prior to the date of death and the surviving spouse or domestic partner has attained age 55 on or prior to the date of death. There are four optional retirement allowances the member may choose. Each of the optional retirement allowances requires a reduction in the unmodified retirement allowance in order to allow the member the ability to provide certain benefits to a surviving spouse, domestic partner, or named beneficiary having an insurable interest in the life of the member.

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

FCERA provides an annual cost-of-living benefit to all retirees in Tier 1, 2, or 3. The cost-of-living adjustment, based upon the Consumer Price Index for the West Region (with 1982-84 as the base period), is capped at 3.0%.

The County of Fresno and the other participating agencies contribute to the retirement plan based upon actuarially determined contribution rates adopted by the Board of Retirement. Employer contribution rates are adopted annually based upon recommendations received from FCERA's actuary after the completion of the annual actuarial valuation. The average employer contribution rate as of June 30, 2017 for 2016-2017 (based on the June 30, 2015 valuation) was 51.37% of compensation.

Members are required to make contributions to FCERA regardless of the retirement plan or tier in which they are included. The average member contribution rate as of June 30, 2017 for 2016-2017 (based on the June 30, 2015 valuation) was 9.39% of compensation.

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

EXHIBIT 2

Net Pension Liability

The components of the Net Pension Liability as follows:

	June 30, 2017	June 30, 2016
Total Pension Liability	\$5,713,538,731	\$5,542,506,355
Plan Fiduciary Net Position	<u>4,407,221,766</u>	<u>4,009,495,932</u>
Net Pension Liability	\$1,306,316,965	\$1,533,010,423
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	77.14%	72.34%

The Net Pension Liability (NPL) was measured as of June 30, 2017 and 2016. The Plan Fiduciary Net Position (plan assets) was valued as of the measurement date while the Total Pension Liability (TPL) was determined based upon rolling forward the TPL from actuarial valuations as of June 30, 2016 and 2015, respectively.

Plan provisions. The plan provisions used in the measurement of the NPL as of June 30, 2017 and 2016 are the same as those used in the FCERA actuarial valuation as of June 30, 2017 and 2016, respectively.

Actuarial assumptions. The TPL as of June 30, 2017 and June 30, 2016¹ were determined by actuarial valuations as of June 30, 2016 and June 30, 2015, respectively. The actuarial assumptions used were based on the results of an experience study for the period from July 1, 2012 through June 30, 2015. They are the same assumptions used in the June 30, 2017 funding valuation for FCERA. The assumptions are outlined on page 10 of this report. In particular, the following actuarial assumptions were applied to all periods included in the measurement:

¹ Because new actuarial assumptions were adopted by the Board for the June 30, 2016 funding valuation, the TPL as of June 30, 2016 was remeasured by (1) revaluing the TPL as of June 30, 2015 (before the roll forward) to include the actuarial assumptions that the Retirement Board adopted for use in the funding valuation as of June 30, 2016 and (2) using this revalued TPL in rolling forward the results from June 30, 2015 to June 30, 2016.

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Inflation	3.00%
Salary increases	General: 4.50% to 11.50% and Safety: 4.90% to 11.50%, vary by service, including inflation
Investment rate of return	7.00%, net of pension plan investment expense, including inflation
Administrative expenses	1.10% of payroll allocated to both the employer and member based on the components of the total contribution rate (before expenses) for the employer and member.
Other assumptions	See analysis of actuarial experience during the period July 1, 2012 through June 30, 2015

The long-term expected rate of return on pension plan investments was determined using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. These returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adding expected inflation and subtracting expected investment expenses and a risk margin. The target allocation and projected arithmetic real rates of return for each major asset class, after deducting inflation, but before deducting investment expenses, used in the derivation of the long-term expected investment rate of return assumption are summarized in the following table:

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

Asset Class	Target Allocation	Long-Term Expected Arithmetic Real Rate of Return
Large Cap U.S. Equity	14%	5.80%
Small Cap U.S. Equity	3%	6.52%
Developed International Equity	12%	6.89%
Emerging Markets Equity	7%	8.88%
U.S. Core Fixed Income	5%	0.76%
High Yield Fixed Income	5%	3.55%
Global Bonds	7%	0.41%
Bank Loans	5%	2.34%
TIPS	4%	0.41%
Emerging Market Debt	5%	4.52%
Real Estate	5%	4.48%
Commodities	3%	4.14%
Infrastructure	3%	3.80%
Hedge Funds	8%	4.40%
Private Credit	8%	7.70%
Private Equity	<u>6%</u>	9.00%
Total	100%	

Discount rate: The discount rates used to measure the TPL was 7.00% as of both June 30, 2017 and June 30, 2016, respectively. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the actuarially determined contribution rates. For this purpose, only employer contributions that are intended to fund benefits for current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs for future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the Plan Fiduciary Net Position was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL as of both June 30, 2017 and June 30, 2016.

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

Sensitivity of the Net Pension Liability to changes in the discount rate. The following presents the NPL as of June 30, 2017, calculated using the discount rate of 7.00%, as well as what the NPL would be if it were calculated using a discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate:

	1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
FCERA's Net Pension Liability as of June 30, 2017	\$2,103,213,222	\$1,306,316,965	\$653,541,476

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

EXHIBIT 3

Schedules of Changes in Net Pension Liability – Last Two Fiscal Years

	2017	2016
Total Pension Liability		
1. Service cost	\$109,231,556	\$105,592,251
2. Interest	381,845,701	366,855,100
3. Change of benefit terms	0	0
4. Differences between expected and actual experience	(70,197,987)	(42,178,682)
5. Changes of assumptions	0	235,227,824
6. Benefit payments, including refunds of member contributions	(249,846,894)	(240,231,354)
7. Net change in Total Pension Liability	\$171,032,376	\$425,265,139
8. Total Pension Liability – beginning	<u>5,542,506,355</u>	<u>5,117,241,216</u>
9. Total Pension Liability – ending	<u>\$5,713,538,731</u>	<u>\$5,542,506,355</u>
Plan's Fiduciary Net Position		
10. Contributions – employer	\$198,472,119	\$191,529,239
11. Contributions – employee	36,259,132	35,211,756
12. Net investment income	417,603,730	(4,319,055)
13. Benefit payments, including refunds of member contributions	(249,846,894)	(240,231,354)
14. Administrative expense	(4,762,253)	(4,814,003)
15. Other	0	0
16. Net change in Plan's Fiduciary Net Position	\$397,725,834	\$(22,623,417)
17. Plan's Fiduciary Net Position – beginning	<u>4,009,495,932</u>	<u>4,032,119,349</u>
18. Plan's Fiduciary Net Position – ending	<u>\$4,407,221,766</u>	<u>\$4,009,495,932</u>
19. Net Pension Liability – ending (9) – (18)	<u>\$1,306,316,965</u>	<u>\$1,533,010,423</u>
20. Plan's Fiduciary Net Position as a percentage of the Total Pension Liability	77.14%	72.34%
21. Covered employee payroll ⁽¹⁾	\$386,345,000	\$370,318,000
22. Plan's Net Pension Liability as percentage of covered employee payroll	338.12%	413.97%

⁽¹⁾ Covered employee payroll represents compensation earnable and pensionable compensation. Only compensation earnable and pensionable compensation that would possibly go into the determination of retirement benefits are included.

Notes to Schedule:

Benefit changes: None

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

EXHIBIT 4

Schedule of Employer's Contributions – Last Ten Fiscal Years

Year Ended June 30	Actuarially Determined Contributions ⁽¹⁾	Contributions in Relation to the Actuarially Determined Contributions	Contribution Deficiency (Excess)	Covered Payroll ⁽²⁾	Contributions as a Percentage of Covered Payroll
2008	\$97,305,000	\$97,305,000	\$0	\$394,449,000	24.67%
2009	113,959,000	113,959,000	0	399,799,000	28.50%
2010	126,138,000	126,138,000	0	392,713,000	32.12%
2011	130,290,000	130,290,000	0	385,204,000	33.82%
2012	157,869,000	157,869,000	0	346,742,000	45.53%
2013	158,572,000	158,572,000	0	346,808,000	45.72%
2014	165,309,000	165,309,000	0	350,326,000	47.19%
2015	184,213,000	184,213,000	0	351,109,000	52.47%
2016	191,529,000	191,529,000	0	370,318,000	51.72%
2017	198,472,000	198,472,000	0	386,345,000	51.37%

See accompanying notes to this schedule on next page.

⁽¹⁾ All "Actuarially Determined Contributions" through June 30, 2016 were determined as the "Annual Required Contribution" under GAS 25 and 27.

⁽²⁾ Covered payroll represents compensation earnable and pensionable compensation. Only compensation earnable and pensionable compensation that would possibly go into the determination of retirement benefits are included.

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

Notes to Exhibit 4

Methods and assumptions used to establish "actuarially determined contribution" rates:

Valuation date	Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported
Actuarial cost method	Entry Age Actuarial Cost Method
Amortization method	Level percent of payroll (3.75% payroll growth assumed)
Remaining amortization period	UAAL established as of June 30, 2003 is amortized over a declining period (with 18 years remaining as of the June 30, 2015 valuation which set the rates for the 2016/2017 fiscal year) plus 15 years (declining) for UAAL due to actuarial gains or losses, changes in actuarial assumptions or plan amendments ⁽¹⁾ established on each subsequent valuation. ⁽¹⁾
Asset valuation method	The actuarial value of assets is determined by recognizing any difference between the actual and the expected market return over 10 six-month interest crediting periods. The actuarial value of assets is further adjusted, if necessary, to be within 30% of the market value of assets. The valuation value of assets is the actuarial value of assets reduced by the value of the non-valuation reserves. Deferred gains and losses as of June 30, 2011 have been combined and will be recognized in equal amounts over a period of four and a half years from that date.
Actuarial assumptions:	
June 30, 2015 valuation (for year ended 2017 ADC)	
Investment rate of return	7.25%, net of pension plan investment expense, including inflation
Inflation rate	3.25%
Administrative expenses	1.10% of payroll allocated to both the employer and member based on the components of the total contribution rate (before expenses) for the employer and member.
Projected salary increases ⁽²⁾	General: 4.75% to 10.75% and Safety: 5.25% to 10.75%, vary by service, including inflation
Cost of living adjustments	3.00% of retirement income for General Tiers 1, 2 and 3, and Safety Tiers 1 and 2 0.00% for General Tiers 4 and 5 and Safety Tiers 4 and 5
Other assumptions	Same as those used in the June 30, 2015 funding actuarial valuation

⁽¹⁾ Prior to the Board's most recent review of actuarial funding policy in April 2011, a 30-year amortization period was used for plan amendments.

⁽²⁾ Includes inflation at 3.25% plus real across-the-board salary increases of 0.50% plus merit and promotional increases.

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

EXHIBIT 5

Projection of Pension Plan Fiduciary Net Position for Use in Calculation of Discount Rate as of June 30, 2017

(\$ in millions)

Year Beginning July 1,	Projected Beginning Plan Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Plan Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
2016	\$4,009	\$235	\$250	\$5	\$418	\$4,407
2017	4,407	260	272	4	307	4,697
2018	4,697	265	288	4	327	4,997
2019	4,997	295	303	4	348	5,334
2020	5,334	273	318	4	370	5,656
2021	5,656	254	335	4	392	5,963
2022	5,963	234	351	3	412	6,254
2023	6,254	223	369	3	431	6,536
2024	6,536	200	386	3	449	6,797
2025	6,797	153	404	3	465	7,008
2033	8,177	58	553	2	553	8,233
2034	8,233	39	570	2	556	8,256
2035	8,256	28	586	2	556	8,251
2051	6,284	4	651	0 *	415	6,051
2052	6,051	3	642	0 *	399	5,810
2053	5,810	2	631	0 *	382	5,563
2080	371	0	85	0	23	308
2081	308	0	72	0	19	255
2082	255	0	60	0	16	210
2102	56	0	1	0	4	60
2103	60	0	1	0	4	63
2104	63	0	0 *	0	4	67
2122	208	0	0 *	0	15	222
2123	222					
2123	Discounted Value:	0 **				

* Less than \$1 million, when rounded.

** \$222 million when discounted with interest at the rate of 7.00% per annum has a value of less than \$1 million as of June 30, 2016.

SECTION 2: GAS 67 Information for Fresno County Employees' Retirement Association

EXHIBIT 5

Projection of Pension Plan Fiduciary Net Position for Use in Calculation of Discount Rate as of June 30, 2017

(\$ in millions) - continued

Notes:

- (1) Amounts may not total exactly due to rounding.
- (2) Amounts shown in the year beginning July 1, 2016 row are actual amounts, based on the financial statements provided by FCERA.
- (3) Years 2026-2032, 2036-2050, 2054-2079, 2083-2101, and 2105-2121 have been omitted from this table.
- (4) Column (a): Except for the "discounted value" shown for 2123, all of the projected beginning Plan Fiduciary Net Position amounts shown have not been adjusted for the time value of money.
- (5) Column (b): Projected total contributions include member and employer normal cost contributions based on closed group projections (based on covered active members as of June 30, 2016); plus employer contributions to the unfunded actuarial accrued liability; plus employee and employer contributions to fund each year's annual administrative expenses. Contributions are assumed to occur halfway through the year, on average.
- (6) Column (c): Projected benefit payments have been determined in accordance with paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members, and beneficiaries as of June 30, 2016. The projected benefit payments reflect the cost of living increase assumptions used in the June 30, 2017 valuation report.
- (7) Column (d): Projected administrative expenses are assumed to be 1.10% of closed group projected payroll and are assumed to occur halfway through the year, on average.
- (8) Column (e): Projected investment earnings are based on the assumed investment rate of return of 7.00% per annum.
- (9) As illustrated in this Exhibit, the Plan Fiduciary Net Position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.00% per annum was applied to all periods of projected benefit payments to determine the Total Pension Liability as of June 30, 2017 shown earlier in this report, pursuant to paragraph 44 of GASB Statement No. 67.

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