

# City of Fresno Fire and Police Retirement System

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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100 MONTGOMERY STREET, SUITE 500 SAN FRANCISCO, CA 94104  
T 415.263.8200 www.segalco.com

*November 20, 2017*

*Board of Retirement  
City of Fresno Fire and Police Retirement System  
2828 Fresno Street, Suite 201  
Fresno, California 93721-1327*

*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 year 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 City of Fresno Fire and Police Retirement System. The census information and financial information on which our calculations were based was prepared by the Retirement System. That assistance is gratefully acknowledged. The actuarial calculations were completed under the supervision of Andy Yeung, ASA, MAAA, FCA, Enrolled Actuary.*

*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.*


*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 Retirement System.*

*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, MAAA, FCA, EA  
Senior Vice President and Actuary*

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

*JB/hy*

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## SECTION 1: Valuation Summary for the City of Fresno Fire and Police Retirement System

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### Purpose

This report has been prepared by Segal Consulting to present a valuation of the City of Fresno Fire and Police Retirement System 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 System, as administered by the Board of Retirement;
- The characteristics of covered active members, DROP participants, inactive vested members, and retired members and beneficiaries as of June 30, 2017, provided by the Retirement System;
- The assets of the System as of June 30, 2017, provided by the Retirement System;
- 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 which fully fund the Retirement System's liabilities, and which, 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 Retirement System's assets, liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by the Retirement System's staff. This information has not been audited by us, but it has been reviewed and found to be consistent, both internally and with the prior year's information.

The contribution requirements are determined as a percentage of payroll. The System's employer rates provide for both normal cost and a contribution to amortize any unfunded or overfunded actuarial accrued liabilities. Any change in the unfunded actuarial accrued liability (UAAL) that arises due to actuarial gains or losses or due to plan amendments at each valuation is amortized over its own declining 15-year period (with the exception of any change due to temporary retirement incentives which is amortized over its own declining period of up to 5 years). Any change in UAAL that arises from changes in actuarial assumptions or methods will be amortized over its own declining 25-year period. When there is any "actuarial surplus" (the funded ratio is over 110%), the portion of surplus in excess of 110% will be amortized over a non-declining 25-year period.

Please note that the Actuarial Standards Board has adopted Actuarial Standard of Practice (ASOP) No. 4 that provides guidance for actuaries to follow when valuing pension liabilities. For a plan such as that offered by the Retirement System that utilizes the actuarial surplus to provide contribution rate offsets and a Post Retirement Supplemental Benefit (PRSB) benefit, we are required to indicate in the valuation report that the impact of the application of any future actuarial surplus on the future

## SECTION 1: Valuation Summary for the City of Fresno Fire and Police Retirement System

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financial condition of the plan has not been explicitly measured in the valuation. Furthermore, under the revised ASOP No. 4 we have to consider using alternative procedures (such as stochastic modeling) for “gain sharing provisions that trigger benefit increases when investment returns are favorable but do not trigger benefit decreases when investment returns are unfavorable.” Based on our analysis, we do not believe the System’s actuarial surplus distribution provisions would necessarily fall under the guidelines of ASOP No. 4 so as to require quantification. This is based on the observation that only a portion of the surplus is available for distribution (on an amortized basis over 25 years) when the funded status of the System is over 110% in a particular valuation but surplus distribution will be suspended immediately in the following valuation if the funded status falls below 110% in the following valuation. Nonetheless, it should be understood that there is still a financial impact associated with the surplus distribution provision. The Board may wish to consider authorizing a supplemental study so that the potential impact can be quantified.

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:

- Reference:* Pg. 19
- In the June 30, 2016 valuation, the ratio of the valuation value of assets to actuarial accrued liabilities was 119.6%. In this June 30, 2017 valuation, the funding ratio increased slightly to 119.8%. The funding ratios as of June 30, 2016 and 2017 if measured using the market value of assets instead of the valuation value of assets are 114.2% and 121.2%, respectively.
- Reference:* Pg. 30
- The Retirement System’s prefunded actuarial accrued liability (PAAL) as of June 30, 2016 was \$209.2 million on a valuation value of assets basis. In this year’s valuation, the PAAL has increased to \$223.6 million on a valuation value of assets basis. The Plan had a net actuarial experience gain of about \$5.1 million. A reconciliation of the System’s PAAL is provided in Section 3, Exhibit H.
  - As of June 30, 2017, there is an actuarial surplus as the System has valuation value of assets that are in excess of 110% of the actuarial accrued liability. The actuarial surplus in the Retirement System is used to reduce the City’s contribution and to provide a PRSB. The determination and allocation of actuarial surplus as of June 30, 2017 as well as for the last valuation as of June 30, 2016 is provided in Appendix B of this report.
- Reference:* Pg. 15
- The aggregate employer rate calculated in this valuation has decreased from 18.92% of payroll as of June 30, 2016 to 18.72% of payroll as of June 30, 2017. This is a net result of: (i) changes in membership demographics among all active (DROP and non-DROP) members and (ii) a higher surplus offset, offset somewhat by (iii) the difference between the actual and the estimated 2017/2018 fiscal year contributions compared to a similar difference but for the 2016/2017 fiscal year. A reconciliation of the Retirement System’s aggregate employer rate is provided in Section 2, Subsection D (see Chart 14).

## SECTION 1: Valuation Summary for the City of Fresno Fire and Police Retirement System

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- Reference:* Pg. 16
- The aggregate member rate calculated in this valuation has decreased from 8.99% of payroll as of June 30, 2016 to 8.97% of payroll as of June 30, 2017, due to changes in membership demographics among active non-DROP members. A reconciliation of the Retirement System's aggregate member rate is provided in Section 2, Subsection D (see Chart 15).  
  
After around February 2011, active members who signed up for the DROP are required to continue their employee contributions; however, those contributions are deposited into the members' DROP accounts and therefore not available to fund the value of the retirement benefit earned up to the date of the DROP. Therefore, those contributions that will be deposited into the DROP accounts are disregarded in this valuation.
- Reference:* Pg. 6
- As indicated in Section 2, Subsection B (see Chart 7) of this report, the total unrecognized investment **gain** as of June 30, 2017 is \$16.6 million (as compared to an unrecognized **loss** of \$57.7 million in the June 30, 2016 valuation). This deferred investment gain will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years.
  - The unrecognized investment gains of \$16.6 million represent 1.1% of the market value of assets. Unless offset by future investment losses or other unfavorable experience, the recognition of the \$16.6 million market gains is expected to have an impact on the System's future funded ratio and the aggregate employer contributions. To illustrate this potential impact, if the deferred investment gains were recognized immediately in the valuation value of assets:
    - the funded percentage would increase from 119.8% to 121.2%, and
    - the aggregate employer contribution rate for 2018/2019 would decrease from 18.72% of payroll to 18.08% 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 funded percentage would have decreased from 119.6% to 114.2% and the aggregate employer rate would have increased from 18.92% to 21.25% of payroll.
  - 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.

## **SECTION 1: Valuation Summary for the City of Fresno Fire and Police Retirement System**

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### Impact of Future Experience on Contribution Rates

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

- 1) difference 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 City of Fresno Fire and Police Retirement System**

**Summary of Key Valuation Results (Dollar amounts in thousands)**

	June 30, 2017		June 30, 2016	
<b>Employer Contribution Rates:</b>				
	Total Rate	Estimated Annual Amount <sup>(1)</sup>	Total Rate	Estimated Annual Amount <sup>(1)</sup>
Tier 1 Normal Cost Rate	28.45%	\$2,085	28.38%	
Tier 2 Normal Cost Rate	23.07%	22,826	23.15%	
All Categories Combined	23.44%	24,911	23.64%	\$25,123
Surplus Offset	-4.27%	-4,540	-4.12%	-4,378
Contribution (Excess)/Shortfall from Prior Fiscal Year	<u>-0.45%</u>	<u>-473</u>	<u>-0.60%</u>	<u>-638</u>
Required Contributions	18.72%	\$19,898	18.92%	\$20,107
<b>Average Member Contribution Rates:</b>				
	Total Rate	Estimated Annual Amount <sup>(2)</sup>	Total Rate	Estimated Annual Amount <sup>(2)</sup>
Tier 1 <sup>(3)</sup>	0.00%	\$0	5.02%	\$0
Tier 2 <sup>(3)</sup>	8.97%	8,527	8.99%	8,546
All Categories Combined	8.97%	8,527	8.99%	8,546
<b>Funded Status:</b>				
Actuarial Accrued Liability	\$1,131,348		\$1,067,416	
Valuation Value of Assets (VVA)	1,354,974		1,276,604	
Market Value of Assets (MVA) <sup>(4)</sup>	1,371,613		1,218,885	
Funded Percentage on VVA basis	119.8%		119.6%	
Prefunded Actuarial Accrued Liability on VVA basis	\$223,626		\$209,188	
Funded Percentage on MVA basis	121.2%		114.2%	
Prefunded Actuarial Accrued Liability on MVA basis	\$240,265		\$151,469	
<b>Key Economic Assumptions:</b>				
Interest Rate	7.25%		7.25%	
Inflation Rate	3.00%		3.00%	
Across-the-Board Salary Increase	0.50%		0.50%	

<sup>(1)</sup>Based on projected fiscal year 2018-2019 annual payroll for active non-DROP and DROP members of \$106,273.

<sup>(2)</sup>Based on projected fiscal year 2018-2019 annual payroll for members not in the DROP of \$95,066.

<sup>(3)</sup>Reflects that Tier 1 members over age 60 with at least 20 years of service and Tier 2 members over age 60 with at least 10 years of service do not have to make a member contribution.

<sup>(4)</sup>Excludes non-valuation reserves.



## SECTION 1: Valuation Summary for the City of Fresno Fire and Police Retirement System

### Summary of Key Valuation Demographic and Financial Data

	June 30, 2017	June 30, 2016	Change From Prior Year
<b>Active Members:</b>			
<b>Non-DROP</b>			
Number of members	990	947	4.5%
Average age	40.3	40.6	-0.3
Average service	11.8	11.9	-0.1
Projected total compensation <sup>(1)</sup>	\$91,850,923	\$86,884,960	5.7%
Average projected compensation	\$92,779	\$91,748	1.1%
<b>DROP</b>			
Number of members	96	107	-10.3%
Average age	57.0	56.5	0.5
Average service	22.9	23.4	-0.5
Projected total compensation <sup>(1)</sup>	\$10,828,198	\$11,932,935	-9.3%
Average projected compensation	\$112,794	\$111,523	1.1%
<b>Retired Member and Beneficiaries:</b>			
Number of members:			
Service retired	367	359	2.2%
Disability retired	405	385	5.2%
Beneficiaries	274	267	2.6%
Total	1,046	1,011	3.5%
Average age	67.2	67.0	0.2
Average monthly benefit <sup>(2)</sup>	\$3,750	\$3,580	4.7%
<b>Vested Terminated Members:</b>			
Number of vested terminated members <sup>(3)</sup>	117	102	14.7%
Average age	39.8	40.4	-0.6
<b>Summary of Financial Data (dollar amounts in thousands):</b>			
Market value of assets <sup>(4)</sup>	\$1,509,543	\$1,351,289	11.7%
Return on market value of assets	14.41%	0.45%	N/A
Actuarial value of assets	\$1,492,904	\$1,409,008	6.0%
Return on actuarial value of assets	8.47%	7.26%	N/A
Valuation value of assets	\$1,354,974	\$1,276,604	6.1%
Return on valuation value of assets	7.85%	6.26%	N/A

<sup>(1)</sup> June 30, 2016 payroll was projected payroll for fiscal year 2016/2017. June 30, 2017 payroll was projected payroll for fiscal year 2017/2018.

<sup>(2)</sup> Excludes supplemental benefits (if any) paid from PRSB and benefits derived from DROP account balances.

<sup>(3)</sup> Includes terminated members due a refund of member contributions.

<sup>(4)</sup> Includes non-valuation reserves.

## SECTION 1: Valuation Summary for the City of Fresno Fire and Police Retirement System

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### 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 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 of benefits.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by the Retirement System. 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 the Retirement System.
- **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 Retirement System. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- 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

## SECTION 1: Valuation Summary for the City of Fresno Fire and Police Retirement System

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cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

- If the Retirement System 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 Retirement System 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 the Retirement System, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Retirement System.

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**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**

<b>Year Ended June 30</b>	<b>Active Members <sup>(1)</sup></b>	<b>Vested Terminated Members <sup>(2)</sup></b>	<b>Retired Members and Beneficiaries</b>	<b>Ratio of Non-Actives to Actives</b>
2008	1,182	73	856	0.79
2009	1,164	76	865	0.81
2010	1,135	57	902	0.84
2011	1,071	53	948	0.93
2012	1,055	50	960	0.96
2013	1,015	60	968	1.01
2014	998	69	978	1.05
2015	993	87	1,005	1.10
2016	1,054	102	1,011	1.06
2017	1,086	117	1,046	1.07

<sup>(1)</sup> Includes DROP members.

<sup>(2)</sup> Includes terminated members due a refund of member contributions.

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**Non-DROP Active Members**

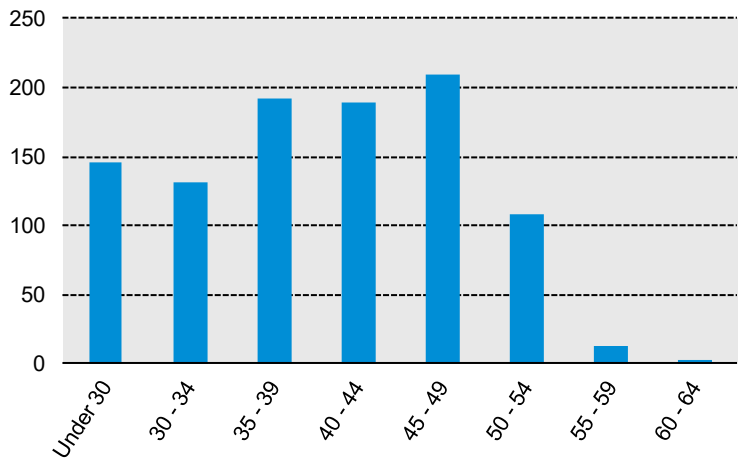
Plan costs are affected by the age, years of service and salaries of active members. In this year's valuation, there were 990 non-DROP active members with an average age of 40.3, average years of service of 11.8 years and average salary of \$92,779. The 947 non-DROP active members in the prior valuation had an average age of 40.6, average service of 11.9 years and average salary of \$91,748.

**Inactive Members**

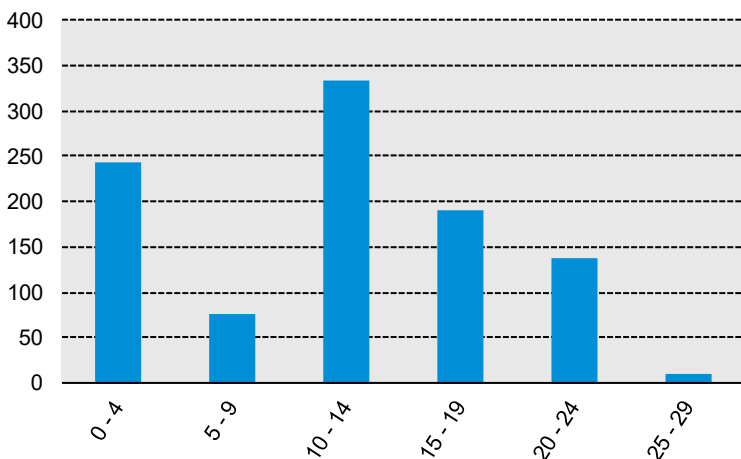
In this year's valuation, there were 117 members with a vested right to a deferred or immediate vested benefit versus 102 members in the prior valuation.

*These graphs show a distribution of non-DROP active members by age and by years of service.*

**CHART 2**  
**Distribution of Non-DROP Active Members by Age as of June 30, 2017**



**CHART 3**  
**Distribution of Non-DROP Active Members by Years of Service as of June 30, 2017**



**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**DROP Active Members**

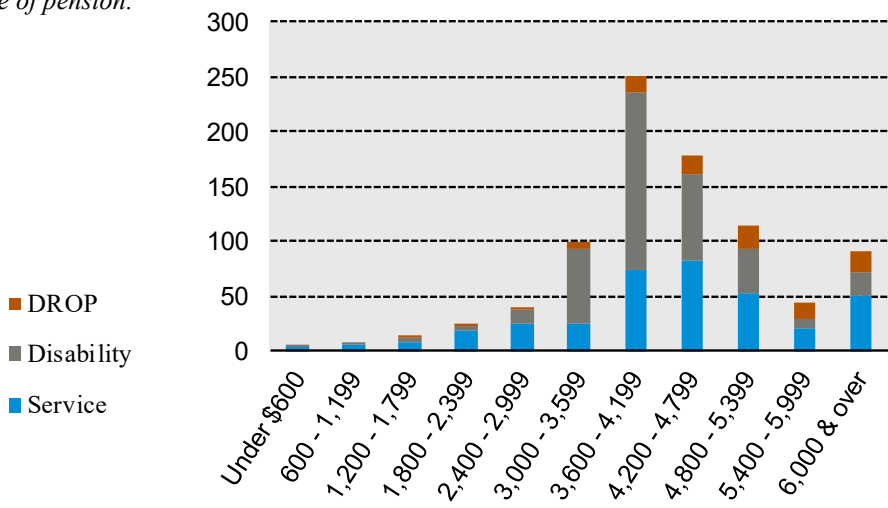
In this year's valuation, there were 96 DROP active members with an average age of 57.0 years, average years of service of 22.9 and average compensation of \$112,794. The 107 DROP active members in the prior valuation had an average age of 56.5 years, average years of service of 23.4 and average compensation of \$111,523.

**Retired Members and Beneficiaries**

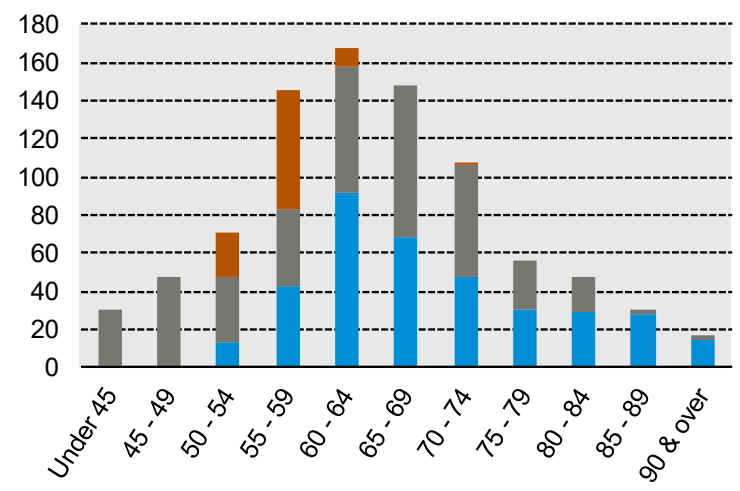
As of June 30, 2017, 772 retired members and 274 beneficiaries were receiving total monthly benefits of \$3,922,504. For comparison, in the previous valuation, there were 744 retired members and 267 beneficiaries receiving monthly benefits of \$3,619,626.

*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 City of Fresno Fire and Police Retirement System**

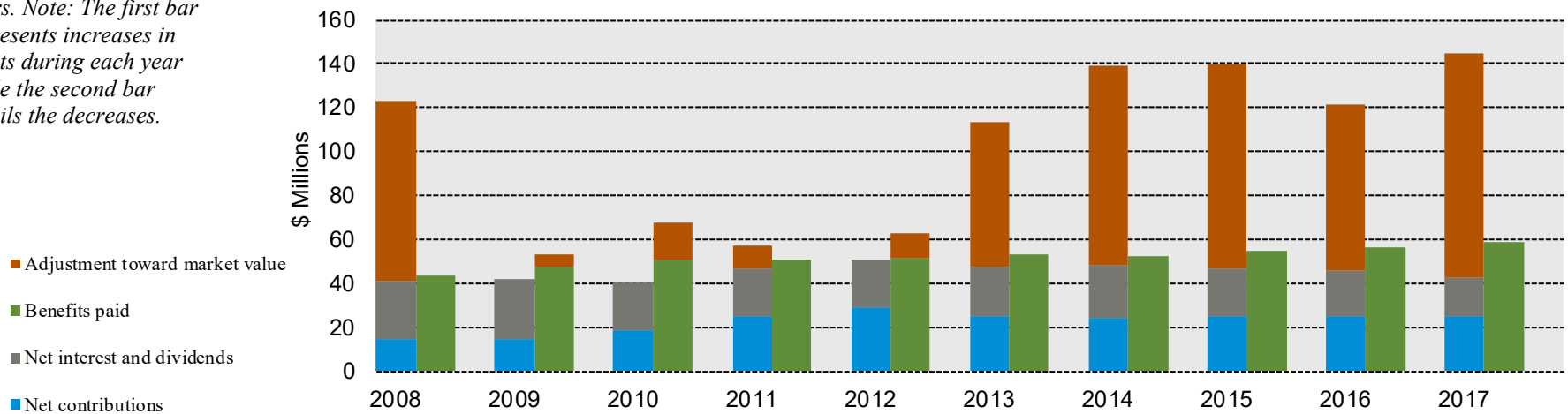
**B. FINANCIAL INFORMATION**

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.

*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, 2008-2017**



## SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System

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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 and Valuation Value of Assets are provided on the following page.



**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**CHART 7**

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

Plan Year Ending June 30	Total Actual Market Return	Expected Return	Investment Gain/(Loss) <sup>(1)</sup>	Deferred Factor	Deferred Return
2014	\$201,837,997	\$88,430,161	\$113,407,836	0.2	\$22,681,567
2015	39,163,617	101,417,840	(62,254,223)	0.4	(24,901,689)
2016	6,063,102	102,072,870	(96,009,768)	0.6	(57,605,861)
2017	192,314,904	96,733,724	95,581,180	0.8	76,464,944
1. Total Deferred Return					\$16,638,961
2. Net Market Value					1,509,542,788
3. Actuarial Value of Assets (Item 2 – Item 1)					\$1,492,903,827
4. Ratio of Actuarial Value to Market Value					98.9%
5. Non-Valuation Reserves and Other Adjustments					
a. DROP Reserve					\$135,164,000
b. PRSB Reserve					1,854,000
c. City Surplus Reserve <sup>(2)</sup>					912,000
d. Total					137,930,000
6. Valuation Value of Assets (Item 3 – Item 5d)					\$1,354,973,827

<sup>(1)</sup> Administrative expenses are treated as benefit payments and are excluded from the calculation of actual versus expected income.

<sup>(2)</sup> The City Surplus Reserve is treated as a liability; it represents the City's prior excess contributions due to the difference between the actual versus the estimated contributions for 2016/2017. This difference is taken into account in developing the contribution rate requirement for 2018/2019. See Steps (4) and (12) in Table 4 of Appendix B for calculations.

Deferred return as of June 30, 2017 recognized in each of the next four years:

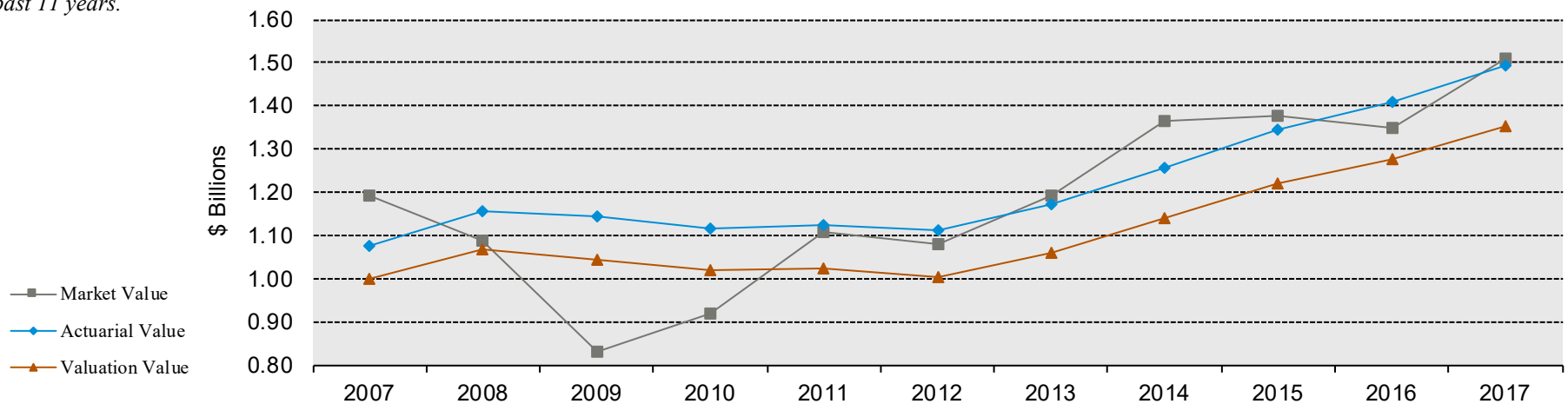
6/30/2018	\$10,145,005
6/30/2019	(12,536,562)
6/30/2020	(85,718)
6/30/2021	19,116,236
	<u>\$16,638,961</u>

## SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System

The market value, actuarial value, and valuation value of assets are representations of the Retirement System'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 value of assets is significant because the Retirement System'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 11 years.*

**CHART 8**  
**Market Value, Actuarial Value and Valuation Value of Assets as of June 30, 2007-2017**



**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

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**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 \$5.1 million, including a gain of \$14.0 million from investments (after smoothing) and a loss of \$8.9 million from all other sources. The net experience variation from individual sources other than investments was 0.8% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

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

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**CHART 9**  
**Actuarial Experience for Year Ended June 30, 2017**

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1. Net gain/(loss) from investments <sup>(1)</sup>	\$13,973,000
2. Net gain/(loss) from other experience <sup>(2)</sup>	<u>(8,848,000)</u>
3. Net experience gain/(loss): (1) + (2)	\$5,125,000

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<sup>(1)</sup> Details in Chart 10.

<sup>(2)</sup> See Items (6a), (6c) through (6e) in Section 3, Exhibit H.

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**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 the Retirement System’s investment policy. For valuation purposes, the assumed rate of return on the valuation value of assets was 7.25% (based on the June 30, 2016 valuation). The actual rate of return on a valuation basis for the 2016/2017 fiscal year was 8.36%.

Since the actual return for the year was more than the assumed return, the Retirement System experienced an actuarial gain 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 Value, Actuarial Value and Valuation Value of Assets**

	<b>Market Value</b>	<b>Actuarial Value</b>	<b>Valuation Value</b>
1. Actual return	\$192,314,904	\$117,957,029	\$105,542,082
2. Average value of assets	\$1,334,258,262	\$1,391,977,176	\$1,263,017,650
3. Actual rate of return: (1) ÷ (2)	14.41%	8.47%	8.36%
4. Assumed rate of return	7.25%	7.25%	7.25%
5. Expected return: (2) x (4)	\$96,733,724	\$100,918,345	\$91,568,780
6. Actuarial gain/(loss): (1) – (5)	<u>\$95,581,180</u>	<u>\$17,038,684</u>	<u>\$13,973,302</u>

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

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	\$(76,360,019)	(6.48%)	\$108,238,256	10.19%	\$91,350,305	9.24%
2009	(223,116,857)	(20.81%)	21,006,314	1.84%	7,352,713	0.70%
2010	118,017,947	14.45%	4,642,820	0.41%	1,619,733	0.16%
2011	215,994,016	23.84%	31,935,944	2.89%	28,156,867	2.80%
2012	(6,201,334)	(0.56%)	10,823,427	0.97%	3,177,454	0.31%
2013	140,701,338	13.19%	88,595,923	8.07%	75,341,263	7.57%
2014	201,837,997	17.12%	114,397,808	9.88%	98,429,333	9.35%
2015	39,163,617	2.90%	114,934,646	9.24%	95,800,897	8.45%
2016	6,063,102	0.45%	96,387,718	7.26%	75,784,858	6.26%
2017	192,314,904	14.41%	117,957,029	8.47%	105,542,082	8.36%
<b>Five-Year Annualized Average Return</b>		9.41%	<b>Actuarial Value</b>		8.58%	7.99%
<b>Ten-Year Annualized Average Return</b>		5.05%	<b>Valuation Value</b>		5.86%	5.25%

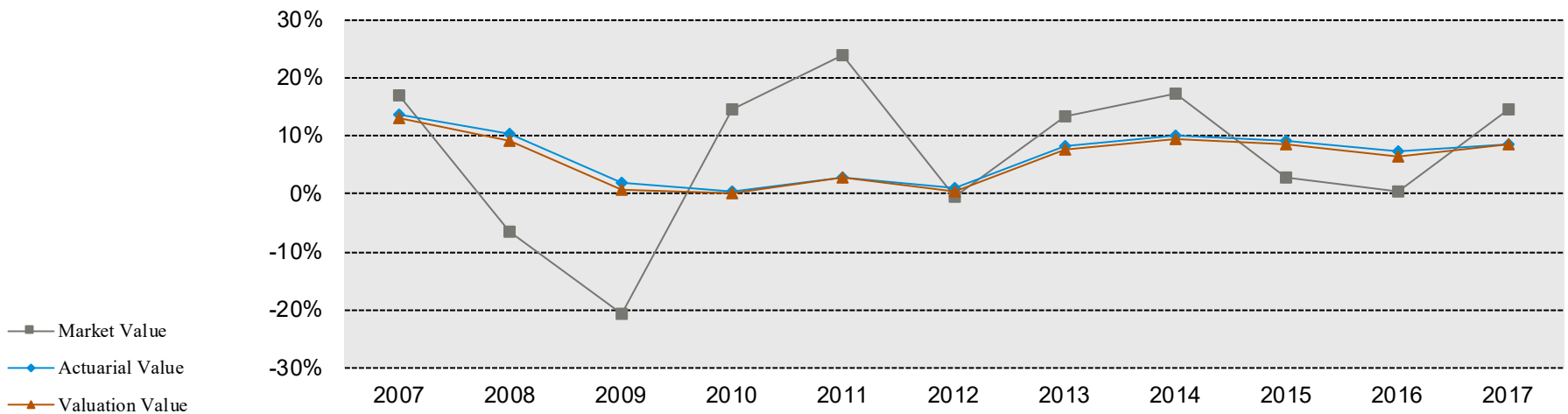
**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

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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.

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**CHART 12**  
**Market, Actuarial and Valuation Rates of Return for Years Ended June 30, 2007 - 2017**



## SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System

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### **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,
- DROP experience different than assumed, and
- COLA increase different than assumed.

The net loss from this other experience for the year ended June 30, 2017 amounted to \$8.9 million which is 0.8% of the actuarial accrued liability. See Section 3, Exhibit H for a detailed development of the prefunded actuarial accrued liability.

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

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**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 prefunded actuarial accrued liability) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the Retirement System) 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). Effective with the June 30, 2013 valuation, any new UAAL established on each subsequent valuation as a result of actuarial gains or losses or plan amendments are amortized over separate 15-year declining periods (with the exception of temporary retirement incentives which are amortized over its own declining period of up to 5 years). Any new UAAL established as a result of changes in actuarial assumptions or methods at each valuation is amortized over separate 25-year declining periods. Any actuarial surplus (when the funded ratio is over 110% will be amortized over a non-declining 25-year period.

The recommended employer contributions are provided on Chart 13.

Member Contributions

*Tier 1*

Provide 1/3 of the funding required to pay a benefit equal to 50% of FAS at age 50 (or when a member has 20 years of service if later but not later than age 60) to a member with 66-2/3% automatic continuance payable to his/her eligible spouse/domestic partner (§3-319). The contribution will be prorated if the member has less than 20 years of service at age 60.

*Tier 2*

9% of pay (§3-405).



**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**CHART 13**  
**Recommended Employer Contribution Rates (Dollar Amounts in Thousands)**

	<u>June 30, 2017</u>		<u>June 30, 2016</u>	
	<u>Rate</u>	<u>Estimated Annual Amount<sup>(1)</sup></u>	<u>Rate</u>	<u>Estimated Annual Amount<sup>(1)</sup></u>
<b>Tier 1 Members</b>				
Normal Cost	28.45%	\$2,085	28.38%	
<b>Tier 2 Members</b>				
Normal Cost	23.07%	22,826	23.15%	
<b>All Categories Combined</b>				
Normal Cost	23.44%	24,911	23.64%	\$25,123
Surplus Offset	-4.27%	-4,540	-4.12%	-4,378
Contribution (Excess)/Shortfall from Prior Fiscal Year	<u>-0.45%</u>	<u>-473</u>	<u>-0.60%</u>	<u>-638</u>
<b>Total Contribution</b>	<b>18.72%</b>	<b>\$19,898</b>	<b>18.92%</b>	<b>\$20,107</b>

<sup>(1)</sup> Amounts are in thousands and are based on projected fiscal year 2018 – 2019 annual payroll for active non-DROP and DROP members (also in thousands):

<b>Tier 1</b>	\$7,329
<b>Tier 2</b>	<u>98,944</u>
<b>Total</b>	\$106,273

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

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.

**CHART 14**

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

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

	Contribution Rate	Estimated Amount <sup>(1)</sup>
1. Recommended Contribution Rate as of June 30, 2016 (for 2017/2018 fiscal year)	18.92%	\$20,107
a. Reverse effect of 2016/2017 fiscal year contribution offset included in the above rate (payable 2017/2018)	0.60%	-\$638
b. Reverse effect of surplus allocated to the City in the 6/30/2016 valuation for the 2017/2018 fiscal year	<u>4.12%</u>	<u>-\$4,378</u>
c. Normal Cost Rate as of June 30, 2016	23.64%	\$25,123
2. Effect of actuarial experience during 2016/2017 on Normal Cost Rate		
a. Effect of changes in membership demographics among all active (DROP and non-DROP) members	<u>-0.20%</u>	<u>-\$212</u>
b. Normal Cost Rate as of June 30, 2017	23.44%	\$24,911
3. Credit for the difference between the actual and the estimated 2017/2018 fiscal year contributions	-0.45%	-\$473
4. Credit for surplus allocated to the City in the 6/30/2017 valuation for the 2018/2019 fiscal year	<u>-4.27%</u>	<u>-\$4,540</u>
5. Recommended Contribution Rate as of June 30, 2017 (for 2018/2019 fiscal year)	18.72%	\$19,898

<sup>(1)</sup> Based on projected fiscal year 2018 – 2019 annual payroll of \$106,273 for active non-DROP and DROP members.

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

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

**CHART 15**

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

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

	Contribution Rate	Estimated Amount <sup>(1)</sup>
Average Contribution Rate as of June 30, 2016	8.99%	\$8,546
Effect of changes in membership demographics among active non-DROP members	<u>-0.02%</u>	<u>-\$19</u>
Average Contribution Rate as of June 30, 2017	8.97%	\$8,527

<sup>(1)</sup> Based on projected fiscal year 2018 – 2019 annual payroll for members NOT in the DROP of \$95,066.

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**CHART 16**  
**Breakdown of Normal Cost Rate**

As requested by the Retirement System, we have provided a breakdown of the Normal Cost to fund each type of benefit.

	<u>June 30, 2017</u>	
	<u>Tier 1</u>	<u>Tier 2</u>
Service Retirement	(2)	20.19%
Vested Deferred Retirement and Contribution Refunds	(2)	1.63%
Death-In-Service	(2)	0.50%
Disability	(2)	<u>9.37%</u>
<b>Total Normal Cost</b>	28.45%	31.69%
Less		
Employee Contributions <sup>(1)</sup>	<u>0.00%</u>	<u>8.62%</u>
Equals		
<b>Net Employer Normal Cost</b>	28.45%	23.07%

<sup>(1)</sup> The offset for employee contributions is less than the aggregate employee rate because it expresses the employee contribution dollar amount as a percent of projected fiscal year 2018-2019 annual payroll for all active members (non-DROP and DROP) of \$106,273 instead of annual payroll for only active non-DROP members of \$95,066.

<sup>(2)</sup> We have not provided a breakdown of the normal cost by type of benefit because all Tier 1 members are in the DROP.

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

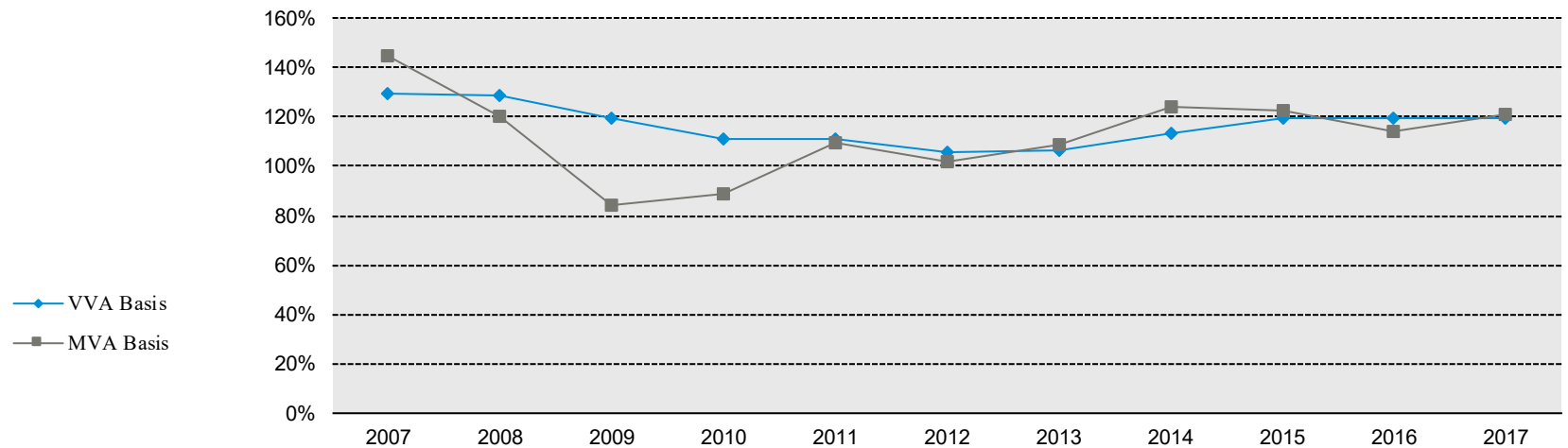
**E. FUNDED RATIO**

A critical piece of information regarding the Plan’s financial status is the funded ratio. This ratio compares the valuation value of assets and market value of assets to the actuarial accrued liabilities of the plan. High ratios indicate a well-funded plan with assets sufficient to pay most benefits. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other changes.

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.

The chart below depicts a history of the funded ratio for the plan.

**CHART 17**  
**Funded Ratio for Plan Years ending June 30, 2007 - 2017**



**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**CHART 18**

**Schedule of Funding Progress (Dollar Amounts in Thousands)**

<b>Actuarial Valuation Date</b>	<b>Valuation Value of Assets (a)</b>	<b>Actuarial Accrued Liability (AAL) (b)</b>	<b>Prefunded AAL (a) - (b)</b>	<b>Funded Ratio (%) (a) / (b)</b>	<b>Covered Payroll (c)</b>	<b>Prefunded AAL/ (UAAL) as a Percentage of Covered Payroll (%) [(a) - (b)] / (c)</b>
6/30/2008	\$1,066,778	\$830,036	\$236,742	128.5	\$98,913	239.3
6/30/2009	1,045,774	874,355	171,419	119.6	102,355	167.5
6/30/2010	1,018,605	919,286	99,319	110.8	102,686	96.7
6/30/2011	1,022,996	917,941	105,055	111.4	99,000	106.1
6/30/2012	1,003,929	952,866	51,063	105.4	100,596	50.8
6/30/2013	1,061,399	997,836	63,563	106.4	100,705	63.1
6/30/2014	1,142,649	1,006,028	136,621	113.6	96,259	141.9
6/30/2015	1,220,269	1,019,916	200,353	119.6	95,262	210.3
6/30/2016	1,276,604	1,067,416	209,188	119.6	98,818	211.7
6/30/2017	1,354,974	1,131,348	223,626	119.8	102,679	217.8

**SECTION 2: Valuation Results for the City of Fresno Fire and Police Retirement System**

**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 the Retirement System, the current AVR is about 14.7.<sup>(1)</sup> This means that a 1% asset gain/(loss) (relative to the assumed investment return) translates to about 14.7% of one-year’s payroll. Since the Retirement System amortizes actuarial gains and losses over a period of 15 years, there would be a 1.2% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss) if the Retirement System has an unfunded actuarial accrued liability.

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 the Retirement System, the current LVR is about 11.0. This is about 25% lower than the AVR. Therefore, we would expect that contribution volatility will decrease over the long-term.

**CHART 19**  
**Volatility Ratios for Years Ended June 30, 2009 – 2017**

Year Ended June 30	Asset Volatility Ratio	Liability Volatility Ratio
2009	8.1	8.5
2010	8.9	9.0
2011	11.2	9.3
2012	10.7	9.5
2013	11.8	9.9
2014	14.2	10.5
2015	14.5	10.7
2016	13.7	10.8
2017	14.7	11.0

<sup>(1)</sup> The AVR has been calculated without any adjustment for the non-valuation reserves.

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

**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

**EXHIBIT A**

**Table of Plan Coverage - i. Tier 1**

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
<b>Active members in valuation</b>			
<b>Non-DROP</b>			
Number	0	5	-100.0%
Average age	N/A	49.6	N/A
Average service	N/A	26.2	N/A
Projected total compensation	\$0	\$497,861	-100.0%
Projected average compensation	N/A	\$99,572	N/A
Member account balances	\$0	\$1,319,411	-100.0%
Total active vested members	0	5	-100.0%
<b>DROP</b>			
Number	60	76	-21.1%
Average age	55.9	55.8	0.1
Average service	25.3	25.1	0.2
Projected total compensation	\$7,081,495	\$8,812,704	-19.6%
Projected average compensation	\$118,025	\$115,957	1.8%
<b>Vested terminated members</b>			
Number	0	0	N/A
Average age	N/A	N/A	N/A
<b>Retired members</b>			
Number in pay status	335	332	0.9%
Average age	70.9	70.9	0.0
Average monthly benefit <sup>(1)</sup>	\$4,637	\$4,346	6.7%
<b>Disabled members</b>			
Number in pay status	277	274	1.1%
Average age	68.5	67.7	0.8
Average monthly benefit <sup>(1)</sup>	\$4,439	\$4,190	5.9%
<b>Beneficiaries</b>			
Number in pay status	254	253	0.4%
Average age	72.4	71.9	0.5
Average monthly benefit <sup>(1)</sup>	\$2,318	\$2,204	5.2%

<sup>(1)</sup> Excludes supplemental benefits (if any) paid from PRSB and benefits derived from DROP account balances.



**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

**EXHIBIT A**

**Table of Plan Coverage - ii. Tier 2**

Category	Year Ended June 30		Change From Prior Year
	2017	2016	
<b>Active members in valuation</b>			
<b>Non-DROP</b>			
Number	990	942	5.1%
Average age	40.3	40.5	-0.2
Average service	11.8	11.9	-0.1
Projected total compensation	\$91,850,923	\$86,387,099	6.3%
Projected average compensation	\$92,779	\$91,706	1.2%
Member account balances	\$154,606,843	\$141,888,758	9.0%
Total active vested members	747	770	-3.0%
<b>DROP</b>			
Number	36	31	16.1%
Average age	58.7	58.1	0.6
Average service	18.9	19.4	-0.5
Projected total compensation	\$3,746,703	\$3,120,231	20.1%
Projected average compensation	\$104,075	\$100,653	3.4%
<b>Vested terminated members</b>			
Number	117	102	14.7%
Average age	39.9	40.4	-0.5
<b>Retired members</b>			
Number in pay status	32	27	18.5%
Average age	58.4	58.8	-0.4
Average monthly benefit <sup>(1)</sup>	\$2,193	\$2,246	-2.4%
<b>Disabled members</b>			
Number in pay status	128	111	15.3%
Average age	48.6	47.8	0.8
Average monthly benefit <sup>(1)</sup>	\$3,530	\$3,513	0.5%
<b>Beneficiaries</b>			
Number in pay status	20	14	42.9%
Average age	51.7	51.7	0.0
Average monthly benefit <sup>(1)</sup>	\$1,429	\$1,457	-1.9%

<sup>(1)</sup> Excludes supplemental benefits (if any) paid from PRSB and benefits derived from DROP account balances.

**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

**EXHIBIT B**

**Members in Active Service and Projected Average Compensation  
By Age, Years of Service as of June 30, 2017 – Non-DROP Active Members Only**

**i. 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	--	--	--	--	--	--	--	--	--	--	--
35 - 39	--	--	--	--	--	--	--	--	--	--	--
40 - 44	--	--	--	--	--	--	--	--	--	--	--
45 - 49	--	--	--	--	--	--	--	--	--	--	--
50 - 54	--	--	--	--	--	--	--	--	--	--	--
55 - 59	--	--	--	--	--	--	--	--	--	--	--
60 - 64	--	--	--	--	--	--	--	--	--	--	--
65 - 69	--	--	--	--	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--

*Note: Excludes 60 active members in DROP with projected average compensation of \$118,025.*

**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

**EXHIBIT B**

**Members in Active Service and Projected Average Compensation  
By Age, Years of Service as of June 30, 2017 – Non-DROP Active Members Only**

**ii. Tier 2**

Age	Years of Service								
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	48	48	--	--	--	--	--	--	--
	\$61,754	\$61,754	--	--	--	--	--	--	--
25 - 29	97	89	8	--	--	--	--	--	--
	70,901	68,590	\$96,611	--	--	--	--	--	--
30 - 34	131	64	33	34	--	--	--	--	--
	84,919	75,460	92,360	\$95,504	--	--	--	--	--
35 - 39	192	29	21	125	17	--	--	--	--
	93,687	80,658	93,346	95,317	\$104,355	--	--	--	--
40 - 44	189	9	8	90	66	16	--	--	--
	98,215	84,751	90,885	95,632	102,718	\$105,403	--	--	--
45 - 49	209	3	4	56	76	67	3	--	--
	102,466	91,107	91,102	97,015	103,015	106,913	\$117,523	--	--
50 - 54	108	1	--	21	27	53	6	--	--
	104,107	98,074	--	100,627	97,895	105,965	128,834	--	--
55 - 59	13	--	1	5	5	2	--	--	--
	105,611	--	95,557	99,738	105,657	125,206	--	--	--
60 - 64	3	--	--	3	--	--	--	--	--
	100,795	--	--	100,795	--	--	--	--	--
65 - 69	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
Total	990	243	75	334	191	138	9	--	--
	\$92,779	\$71,487	\$92,908	\$96,155	\$102,377	\$106,639	\$125,063	--	--

*Note: Excludes 36 active members in DROP with projected average compensation of \$104,075.*

**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

**EXHIBIT C**

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

	<b>Non-DROP Active Members</b>	<b>DROP Members</b>	<b>Vested Terminated Members</b>	<b>Pensioners</b>	<b>Disableds</b>	<b>Beneficiaries</b>	<b>Total</b>
Number as of June 30, 2016	947 <sup>(1)</sup>	107 <sup>(1)</sup>	102	359	385	267	2,167
New members	87	0	0	0	0	0	87
Terminations – with vested rights	-18	0	18	0	0	0	0
Contributions Refunds	-8	0	-5	0	0	0	-13
DROP Entry	-12	12	0	0	0	0	0
Retirements	-5	-21	-3	29	0	0	0
New disabilities	-5	-2	-5	-10	22	0	0
Return to work	4	0	-4	0	0	0	0
Died with or without beneficiary	0	0	0	-11	-3	7 <sup>(3)</sup>	-7
Data adjustments	0	0	14 <sup>(4)</sup>	0	1	0	15
Number as of June 30, 2017	990 <sup>(2)</sup>	96 <sup>(2)</sup>	117	367	405	274	2,249

<sup>(1)</sup> There was a total of 1,054 actives (including non-DROP and DROP members) at the beginning of the fiscal year.

<sup>(2)</sup> There was a total of 1,086 actives (including non-DROP and DROP members) at the end of the fiscal year.

<sup>(3)</sup> This is the net increase in the number of beneficiaries after subtracting the number of beneficiaries who died during the year.

<sup>(4)</sup> These are members who are included in the valuation for the first time this year, 13 of whom started and terminated employment during 2016/2017.

**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

**EXHIBIT D**

**Summary Statement of Income and Expenses on an Actuarial Value Basis**

	Year Ended June 30, 2017	Year Ended June 30, 2016
<b>Contribution income:</b>		
Employer contributions	\$18,543,308	\$18,737,948
Employee contributions	8,169,019	7,747,808
Less administrative expenses	<u>-1,500,145</u>	<u>-1,397,068</u>
Net contribution income	\$25,212,182	\$25,088,688
<b>Investment income:</b>		
Interest, dividends and other income	\$25,994,723	\$27,913,722
Adjustment toward market value	100,433,070	75,160,921
Less investment fees	<u>-8,470,764</u>	<u>-6,686,925</u>
Net investment income	<u>117,957,029</u>	<u>96,387,718</u>
<b>Total income available for benefits</b>	<b>\$143,169,211</b>	<b>\$121,476,406</b>
<b>Less benefit payments:</b>		
Benefit payments	-\$57,028,861	-\$54,428,128
Post retirement supplemental benefits	-1,719,441	-980,037
Refunds of contributions	<u>-524,636</u>	<u>-1,172,648</u>
Net benefits payments	-\$59,272,938	-\$56,580,813
<b>Change in reserve for future benefits</b>	<b>\$83,896,273</b>	<b>\$64,895,593</b>

*Note: Results may not total properly due to rounding.*

**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

**EXHIBIT E**

**Summary Statement of Assets**

	Year Ended June 30, 2017	Year Ended June 30, 2016
<b>Cash equivalents</b>	\$2,629,631	\$1,390,848
<b>Accounts receivable:</b>		
Receivables for investments sold	\$1,949,433	\$19,463,564
Interest and dividends	4,385,532	4,074,102
Others receivables	<u>1,415,117</u>	<u>21,473,489</u>
Total accounts receivable	7,750,082	45,011,155
<b>Investments:</b>		
Domestic and international equity	\$843,955,731	\$729,093,477
Government and corporate bonds	332,961,848	349,481,167
Real estate	201,196,024	198,121,186
Emerging market equity	51,229,521	40,064,411
Collateral held for securities lent	125,852,782	114,215,257
Other investments	<u>82,698,143</u>	<u>68,801,424</u>
Total investments at market value	1,637,894,049	1,499,776,922
<b>Total assets</b>	<b>\$1,648,273,762</b>	<b>\$1,546,178,925</b>
<b>Less accounts payable:</b>		
Collateral held for securities lent	-\$125,852,782	-\$114,215,257
Payable for investments and foreign currency purchased	-10,718,949	-76,914,469
Other liabilities	<u>-2,159,243</u>	<u>-3,760,559</u>
Total accounts payable	-\$138,730,974	-\$194,890,285
<b>Net assets at market value</b>	<u><b>\$1,509,542,788</b></u>	<u><b>\$1,351,288,640</b></u>
<b>Net assets at actuarial value</b>	<u><b>\$1,492,903,827</b></u>	<u><b>\$1,409,007,554</b></u>
<b>Net assets at valuation value</b>	<u><b>\$1,354,973,827</b></u>	<u><b>\$1,276,603,554</b></u>

*Note: Results may not total properly due to rounding.*

**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

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**EXHIBIT F**

**Actuarial Balance Sheet**

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An overview of the System’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 System 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 amortization payments.

**Actuarial Balance Sheet (Dollar Amounts in Thousands)**

Assets	<u>Total</u>
1. Total valuation assets	\$1,354,974
2. Present value of future member normal cost	70,394
3. Present value of future employer normal cost	224,203
4. Unfunded/(prefunded) actuarial accrued liability	<u>-223,626</u>
5. Total current and future assets	\$1,425,945
Liabilities	
6. Present value of benefits already granted, excludes current active DROP	\$649,688
7. Present value of benefits for current active DROP	110,720
8. Present value of benefits to be granted	<u>665,537</u>
9. Total liabilities	\$1,425,945

**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

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**EXHIBIT G**

**Summary of Reported Asset Information as of June 30, 2017**

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	<b>Reserves \$(000)</b>
Employer Advance/Retired Reserves	\$1,206,941
Active Member Reserves	135,164
DROP Reserve <sup>(1)</sup>	164,672
Reserve for PRSB <sup>(1)</sup>	1,854
Reserve for City Surplus <sup>(1),(2)</sup>	912
Net Assets Held in Trust for Benefits	<u>\$1,509,543</u>

*Note: Results may not add due to rounding*

<sup>(1)</sup> *Non-valuation reserve*

<sup>(2)</sup> *The City Surplus Reserve is treated as a liability; it represents the City's prior excess contributions due to the difference between the actual versus the estimated contributions for 2016/2017. This difference is taken into account in developing the contribution rate requirement for 2018/2019.*



**SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System**

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**EXHIBIT H**

**Development of Unfunded / (Prefunded) Actuarial Accrued Liability as of June 30, 2017**

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	<b>(Dollar amounts in Thousands)</b>
1 Unfunded/(prefunded) actuarial accrued liability at beginning of year	-\$209,188
2 Gross Normal Cost at middle of year	32,245
3 Expected employer and member contributions	-26,597
4 Interest (whole year on (1) plus half year on (2) + (3))	<u>-14,961</u>
5 Expected unfunded/(prefunded) actuarial accrued liability at end of year	-\$218,501
6 Actuarial (gain)/loss due to all changes:	
<u>Experience (gain)/loss</u>	
a. Difference between actual and expected contributions	\$360
b. (Gain)/loss from investment	-13,973
c. Lower than expected salary increases	-8,866
d. Higher than expected COLA benefit increases for continuing retirees and DROP	10,521
e. Other experience (gain)/loss	<u>6,833</u>
f. Subtotal	-5,125
7 Actual unfunded/(prefunded) actuarial accrued liability at end of year (5) + (6f)	-\$223,626

### SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System

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#### EXHIBIT I

#### Section 415 Limitations

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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 limit 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.

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 City of Fresno Fire and Police Retirement System**

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**EXHIBIT J**  
**Definitions of Pension Terms**

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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 will earn over the long-term future net, in this case, of investment and administrative expenses.
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (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 level cost allocated to the current year of service.

**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 (Prefunded) 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 prefunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

### SECTION 3: Supplemental Information for the City of Fresno Fire and Police Retirement System

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

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

**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 actual market rate of return to avoid significant swings in the value of assets from one year to the next.

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**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 274 beneficiaries in pay status)		1,046
2. Members inactive during year ended June 30, 2017 with vested rights		117
3. Members active during the year ended June 30, 2017		1,086
DROP members	96	
Fully vested non-DROP members	747	
Not vested	243	

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

**Assets**

1. Valuation value of assets (\$1,509,543 at market value <sup>(1)</sup> as reported by the Retirement System and \$1,492,904 at actuarial value <sup>(1)</sup> )		\$1,354,974
2. Present value of future normal costs		
Employee	\$70,394	
Employer	<u>224,203</u>	
Total		\$294,597
3. Prefunded actuarial accrued liability		<u>-223,626</u>
4. Present value of current and future assets		\$1,425,945

**Liabilities**

5. Present value of future benefits		
Retired members and beneficiaries	\$649,688	
Inactive members with vested rights	17,560	
DROP members	110,720	
Active non-DROP members	<u>647,977</u>	
Total		\$1,425,945

<sup>(1)</sup> Includes non-valuation reserves.

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

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**EXHIBIT I (continued)**

**Summary of Actuarial Valuation Results**

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	<b>Dollar Amount</b>	<b>% of Payroll<sup>(1)</sup></b>
The determination of the recommended contribution is as follows (amounts in 000s):		
1. Total normal cost	\$33,438	31.47%
2. Expected employee contributions	<u>-8,527</u>	<u>-8.03%</u>
3. Employer normal cost: (1) + (2)	\$24,911	23.44%
4. Surplus offset	-4,540	-4.27%
5. Contribution (excess)/shortfall from prior year	<u>-473</u>	<u>-0.45%</u>
6. Total recommended employer contributions: (3) + (4) + (5)	\$19,898	18.72%
7. Projected payroll <sup>(1)</sup>	\$106,273	

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<sup>(1)</sup> Based on projected fiscal year 2018 – 2019 annual payroll for active non-DROP and DROP members shown in (7).

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**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 May 17, 2016.

**Economic Assumptions**

**Net Investment Return:** 7.25%, net of administration and investment expenses.

**Employee Contribution Crediting Rate:** 7.25%, assumed in the valuation.

**Consumer Price Index:** Increase of 3.00% per year, Tier 1 retiree COLA increases due to changes in average compensation or new salaries adopted are limited to maximum at 3.50% per year (equal to total wage growth composed of 3.00% CPI plus 0.50% across-the-board salary increase) and Tier 2 retiree COLA increases due to CPI are limited to a maximum at 3.00% (equal to 3.00% CPI).

**Salary Increases:**

<u>Annual Rate of Compensation Increase</u>	
Inflation: 3.00% per year; plus 0.50% across-the-board salary increase; plus the following Merit and Promotion increases based on completed years of service.	
<u>Years of Service</u>	<u>Annual Increase</u>
0	8.50%
1	8.00%
2	5.00%
3	4.00%
4	3.75%
5	3.00%
6	1.25%
7	0.75%
8	0.75%
9+	0.50%

## SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System

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### Ongoing Pay Elements

To reflect the cash-out of holiday leave to increase salary on an ongoing basis for Fire employees, we have increased the salary for all active Tier 1 employees and Tier 2 management employees by 3.6% and we have increased the salary for all active Tier 2 non-management employees by 1.8%.

Since the salary data provided by the System already reflects the ongoing cash-out of holiday leave for Police employees, no assumption for Police employees is necessary.

### Cash-out Elements

There is an additional 1.00% increase for Fire and Police management employees and an additional 0.25% increase for Fire and Police non-management employees to reflect the average leave time cash-outs for management employees to increase final average salary at retirement.

There is an additional 7.00% increase for all Fire and Police employees to reflect the conversion of sick leave to increase final average salary at retirement.

To reflect the cash-out of additional holiday leave balance to increase final average salary at retirement for non-management Tier 2 Police employees, there is an additional increase equal to the actual hours reported in an employee's holiday balance if that balance is greater than 96 hours and for those with a balance less than 96 hours the additional increase is equal to 1.5%.

### Demographic Assumptions

#### **Post – Retirement Mortality Rates:**

##### *Healthy:*

Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional scale MP-2015, with no setback for males and set forward one year for females.



#### SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System

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*Disabled:* Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional scale MP-2015, set forward four years.

**Pre – Retirement Mortality Rates:** Headcount-Weighted RP-2014 Employee Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional scale MP-2015, times 75%. All pre-retirement deaths are assumed to be non-service connected deaths.

The tables shown above 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.

*Employee Contribution Rates  
and Optional Benefits:*

For healthy members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional scale MP-2015, with no setback for males and set forward one year for females, weighted 80% male and 20% female.

For beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional scale MP-2015, with no setback for males and set forward one year for females, weighted 20% male and 80% female.

For disabled members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional scale MP-2015, set forward four years, weighted 80% male and 20% female.

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Termination Rates Before Retirement:**

			<b>Rate (%) Mortality</b>	
			<b>Tier 1 &amp; Tier 2</b>	
<u>Age</u>	<u>Male</u>	<u>Female</u>		
25	0.03	0.01		
30	0.03	0.02		
35	0.04	0.02		
40	0.04	0.03		
45	0.07	0.05		
50	0.11	0.08		
55	0.20	0.13		
60	0.35	0.19		
65	0.60	0.26		

All pre-retirement deaths are assumed to be duty.

					<b>Rate (%) Disability</b>	
					<b>Tier 1</b>	<b>Tier 2</b>
<u>Age</u>	<u>Duty</u>	<u>Non-Duty</u>	<u>Duty</u>	<u>Non-Duty</u>		
20	0.02	0.00	0.14	0.00		
25	0.14	0.01	0.29	0.01		
30	0.26	0.01	0.50	0.01		
35	0.39	0.03	0.72	0.03		
40	0.60	0.12	0.98	0.12		
45	0.88	0.25	1.22	0.25		
50	2.80	0.20	1.48	0.20		
55	8.20	0.00	1.78	0.00		
60	0.00	0.00	0.00	0.00		

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Termination Rates Before Retirement (Continued):**

Service	Rate (%)	
	Total Termination (Less than 5 years of service)	
	Tier 1	Tier 2
0 – 1	4.47	12.00
1 – 2	4.47	8.00
2 – 3	4.47	2.00
3 – 4	4.47	1.50
4 – 5	4.47	1.00

100% of members are assumed to elect a withdrawal of contributions. No termination is assumed after a member is assumed to retire.

Age	Rate (%)		
	Total Termination (5 or more years of service)		
	Tier 1		Tier 2
	5 - 10 Years	10+ Years	
20	2.87	3.57	3.10
25	2.87	3.57	2.85
30	1.88	2.63	2.36
35	0.87	1.44	1.74
40	0.44	0.92	1.32
45	0.19	0.63	0.96
50	0.00	0.00	0.00

100% of Tier 1 members with 5 - 10 years of service, 0% of Tier 1 members with 10+ years of service and 50% of Tier 2 members with 5+ years of service are assumed to elect a withdrawal of contributions. The remaining members are assumed to elect a deferred vested benefit. No termination is assumed after a member is assumed to retire.

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Retirement Rates:**

Age	Rate (%)	
	Tier 1	Tier 2
50	12.72	5.31
51	7.63	4.12
52	7.63	4.64
53	5.09	5.09
54	5.09	5.09
55	10.60	19.46
56	13.77	11.72
57	14.03	7.82
58	16.66	9.69
59	29.67	9.17
60	100.00	60.00
61	100.00	60.00
62	100.00	60.00
63	100.00	75.00
64	100.00	75.00
65	100.00	100.00

**DROP Assumptions:**

	Tier 1		Tier 2
First Year Eligible	100%	Eligible but Under Age 55	10%
Second Year Eligible	0%		
Third Year Eligible	0%	Years Since Attaining Age 55 and 5 Years of Service	
Thereafter	0%	First Year	40%
		Second Year	10%
		Third Year	5%
		Fourth Year	0%

Members are assumed to remain in DROP for 7 years.

#### SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System

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

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

Tier 1: Age 50

Tier 2: Age 52

It is assumed that 50% of future deferred vested members will continue to work for a reciprocal employer. For those that continue to work for a reciprocal employer, a 4.0% compensation increase per annum is assumed.

---

**Future Benefit Accruals:**

1.0 year of service per year.

**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:**

85%

**Age of Spouse:**

Wives are 2 years younger than their husbands.

## SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System

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### **Actuarial Methods**

<b>Actuarial Cost Method:</b>	Entry Age Actuarial 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.
<b>Actuarial Value of Assets:</b>	The Actuarial Value of Assets is determined by phasing in any difference between actual market return and expected return on market value over 5 years.
<b>Valuation Value of Assets:</b>	The Actuarial Value of Assets reduced by the value of the non-valuation reserves.
<hr/>	
<b>Change in Actuarial Assumptions or Methods:</b>	There have been no changes in actuarial assumptions or methods since the previous actuarial valuation.

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

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**EXHIBIT III**  
**Summary of Plan Provisions**

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

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**Membership Eligibility:**

- |               |   |
|---------------|---|
|               | All sworn Fire, Police, and Airport Public Safety personnel are eligible. |
| <i>Tier 1</i> | Safety members hired before August 27, 1990.                              |
| <i>Tier 2</i> | Safety members hired on or after August 27, 1990.                         |
- 

**Final Compensation (FAS) for  
Benefit Determination:**

- |               |   |
|---------------|---|
| <i>Tier 1</i> | Final highest consecutive thirty-six months of compensation earnable calculated using the rate of pay actually earned by the member in effect at the time of retirement. Some members are also entitled to final compensation determined based on a rank average (§3-301 and §3-302). |
| <i>Tier 2</i> | Highest consecutive thirty-six months of compensation earnable during any thirty-six months of service before the date of retirement (§3-401).  |
- 

**Service:** Years of service (Yrs).

---

**Service Retirement Eligibility:**

- |               |  |
|---------------|--|
| <i>Tier 1</i> | Age 50 with 10 years of service, or age 65 regardless of service (§3-332). |
| <i>Tier 2</i> | Age 50 with 5 years of service, or age 65 regardless of service (§3-410).  |

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

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**Benefit Formula:**

*Tier 1 (§3-333)*

If a member has at least 20 years of service at retirement from active status:

$55\% * FAS +$   
 $Yrs\ of\ service\ in\ excess\ of\ 20\ completed\ after\ age\ 50 * 2.00\% * FAS$

If a member has less than 20 years of service at retirement from active status:

$55\% * FAS * Yrs\ of\ service / 20$

If a member retires from deferred status:

$55\% * FAS * Yrs\ of\ service / (Greater\ of\ 20\ Yrs\ or\ Yrs\ of\ service\ member\ would\ have\ completed\ if\ the\ member\ had\ remained\ in\ City\ service\ until\ age\ 50)$

*Tier 2 (§3-411)*

<b>Retirement Age</b>	<b>Benefit Formula</b>
50	$2.00\% * FAS * Yrs$
51	$2.14\% * FAS * Yrs$
52	$2.28\% * FAS * Yrs$
53	$2.42\% * FAS * Yrs$
54	$2.56\% * FAS * Yrs$
55+	$2.70\% * FAS * Yrs$

**Maximum Benefit**

(§3-333 and §3-411):

75% of FAS



**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

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**Deferred Retirement  
Option Program (DROP):**

*Eligibility* Same as Service Retirement.

*Benefits Under DROP* DROP benefits (calculated using age, service and salary at the commencement date of participation in DROP) will be credited to a DROP account with interest at rates determined by the Board. Members will no longer be required to make member contributions. After around February 2011, active members who signed up for the DROP are required to continue their employee contributions; however, those contributions are deposited into the members' DROP accounts and therefore not available to fund the value of the retirement benefit earned up to the date of the DROP. Therefore, those contributions that will be deposited into the DROP accounts are disregarded in this valuation. Members may participate in DROP for up to ten years (§3-353 and §3-424).

---

**Ordinary Disability:**

*Tier 1*

*Eligibility* Ten years of service (§3-335).

*Benefit Formula* Greater of 1.65% x FAS x Yrs, 36.67% of FAS or Service Retirement benefit (§3-336).

*Tier 2*

*Eligibility* Ten years of service (§3-412).

*Benefit Formula* Greater of 1.5% x FAS x Yrs, 33.00% of FAS or Service Retirement benefit (§3-413).

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

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**Duty Disability:**

Tier 1

*Eligibility*

No age or service requirements (§3-335).

*Benefit Formula*

55% of FAS or Service Retirement benefit, if greater (§3-336).

Tier 2

*Eligibility*

No age or service requirements (§3-412)

*Benefit Formula*

50% of FAS or Service Retirement benefit, if greater (§3-413).

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**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 month's compensation (§3-330 and §3-408 for Tier 1 and Tier 2, respectively).

*Death in Line of Duty*

55% (50% for Tier 2) of FAS or Service Retirement benefit, if greater and, payable to eligible spouse/domestic partner or minor children (§3-330 and 3-408 for Tier 1 and Tier 2, respectively).

OR

Vested Members

*Eligibility*

Ten (five for Tier 2) years of service.

*Basic Benefit*

66-2/3% of member's unmodified allowance continued to eligible spouse/domestic partner (§3-338 and §3-415 for Tier 1 and Tier 2, respectively).

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

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**Death After Retirement:**

*All Members*

*Service or*

*Disability Retirement*

66-2/3% of member's unmodified allowance continued to eligible spouse/domestic partner (§3-338 and §3-415 for Tier 1 and Tier 2, respectively).

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**Withdrawal Benefits:**

*Less than Five Years of Service  
(Ten Years for Tier 1)*

Refund of accumulated employee contributions with interest.

*Five or More Years of Service  
(Ten Years for Tier 1)*

If contributions left on deposit, entitled to earned benefits commencing at any time after eligible to retire (§3-344 and §3-420 for Tier 1 and Tier 2, respectively).

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**Post-retirement**

**Cost-of-Living Benefits:**

*Tier 1*

Based on the method chosen by the employee at retirement:  
For members who chose the final 3-year method, future changes based on the change in the weighted mean average compensation attached to all ranks in the department, to a maximum of 5% per year (§3-302).  
For members who chose the Career Rank method, future changes based on a recalculation of retirement based on the new salaries adopted for the current year (§3-301).

*Tier 2*

Future changes based on Consumer Price Index to a maximum of 3% per year (§3-411).

#### SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System

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<b>Member Contributions:</b>	Please refer to Appendix A for specific rates.
<i>Tier 1</i>	Provide 1/3 of the funding required to pay a benefit equal to 50% of FAS at age 50 (or when a member has 20 years of service if later but not later than age 60) to a member with 66-2/3% automatic continuance payable to his/her eligible spouse/domestic partner (§3-319). The contribution will be prorated if the member has less than 20 years of service at age 60. Members who are over age 60 with at least 20 years of service do not have to make member contributions (§3-332).
<i>Tier 2</i>	9% of pay (§3-405). Members who are over age 60 with at least 10 years of service do not have to make member contributions (§3-410).
<i>Tier 1</i>	Refund of contribution paid for 66-2/3% automatic continuance. Provide a refund of contributions at service or disability retirement for those members without an eligible spouse/domestic partner (§3-319).
<b>City Contributions:</b>	Effective with the June 30, 2013 valuation, any new UAAL established on each subsequent valuation as a result of actuarial gains or losses or plan amendments are amortized over separate 15-year declining periods (with the exception of temporary retirement incentives which are amortized over its own declining period of up to 5 years). Any new UAAL established as a result of changes in actuarial assumptions or methods at each valuation is amortized over separate 25-year declining periods. When there is any “actuarial surplus” (the funded ratio is over 110%), the portion of surplus in excess of 110% will be amortized over a non-declining 25-year period.
<b>Post Retirement Supplemental Benefits (PRSB):</b>	PSRB may be paid to active and retired DROP participants and eligible retirees and beneficiaries (§3-354). This benefit has been excluded from this valuation.

**NOTE:** *The summary of major plan provisions is designed to outline principal plan benefits as interpreted for purposes of the actuarial valuation. If the Retirement System should find the plan summary not in accordance with the actual provisions, the Retirement System should alert the actuary so they can both be sure the proper provisions are valued.*

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix A  
Member Contribution Rates**

Comparison of member rates calculated in the June 30, 2017 and June 30, 2016 valuations:

	<u>June 30, 2017</u>		<u>June 30, 2016</u>	
	<u>Rate</u>	<sup>(1)</sup> <u>Estimated Annual Amount</u>	<u>Rate</u>	<sup>(1)</sup> <u>Estimated Annual Amount</u>
Tier 1 Members	0.00%	\$0	5.02%	\$0
Tier 2 Members	8.97%	\$8,527	8.99%	\$8,546
All Member Categories Combined	8.97%	\$8,527	8.99%	\$8,546

<sup>(1)</sup> Amounts are in thousands and are based on the following projected fiscal year 2018 – 2019 annual payroll for active members NOT in the DROP (also in thousands):

<b>Tier 1</b>	\$0
<b>Tier 2</b>	<u>95,066</u>
<b>Total</b>	\$95,066

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix A  
Member Contribution Rates (Continued)**

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

Entry Age	<u>Exact Age</u>		<u>¼ Age</u>		<u>½ Age</u>		<u>¾ Age</u>	
	Rate	Dependent Portion	Rate	Dependent Portion	Rate	Dependent Portion	Rate	Dependent Portion
20	4.34%	0.05676	4.40%	0.05676	4.46%	0.05676	4.51%	0.05676
21	4.57%	0.05676	4.64%	0.05676	4.70%	0.05676	4.76%	0.05676
22	4.82%	0.05676	4.89%	0.05676	4.96%	0.05676	5.03%	0.05676
23	5.10%	0.05676	5.17%	0.05676	5.24%	0.05676	5.32%	0.05676
24	5.39%	0.05676	5.47%	0.05676	5.55%	0.05676	5.63%	0.05676
25	5.71%	0.05676	5.80%	0.05676	5.89%	0.05676	5.97%	0.05676
26	6.06%	0.05676	6.16%	0.05676	6.25%	0.05676	6.35%	0.05676
27	6.44%	0.05676	6.55%	0.05676	6.65%	0.05676	6.76%	0.05676
28	6.86%	0.05676	6.98%	0.05676	7.09%	0.05676	7.21%	0.05676
29	7.32%	0.05676	7.45%	0.05676	7.58%	0.05676	7.71%	0.05676
30	7.84%	0.05676	7.83%	0.05735	7.82%	0.05794	7.80%	0.05852
31	7.79%	0.05911	7.78%	0.05972	7.77%	0.06032	7.76%	0.06093
32	7.75%	0.06154	7.74%	0.06217	7.73%	0.06279	7.72%	0.06342
33	7.70%	0.06405	7.69%	0.06470	7.68%	0.06535	7.67%	0.06599
34	7.66%	0.06664	7.64%	0.06731	7.63%	0.06798	7.62%	0.06865
35	7.60%	0.06931	7.59%	0.07000	7.58%	0.07069	7.56%	0.07138
36	7.55%	0.07207	7.53%	0.07278	7.52%	0.07348	7.51%	0.07419
37	7.49%	0.07490	7.48%	0.07563	7.46%	0.07636	7.45%	0.07710
38	7.43%	0.07783	7.42%	0.07858	7.40%	0.07934	7.38%	0.08009
39	7.37%	0.08085	7.35%	0.08163	7.33%	0.08242	7.32%	0.08320

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix A  
Member Contribution Rates (Continued)**

Entry Age	<u>Exact Age</u>		<u>¼ Age</u>		<u>½ Age</u>		<u>¾ Age</u>	
	Rate	Dependent Portion	Rate	Dependent Portion	Rate	Dependent Portion	Rate	Dependent Portion
40	7.30%	0.08398	7.34%	0.08398	7.37%	0.08398	7.41%	0.08398
41	7.44%	0.08398	7.48%	0.08398	7.51%	0.08398	7.55%	0.08398
42	7.58%	0.08398	7.62%	0.08398	7.66%	0.08398	7.69%	0.08398
43	7.73%	0.08398	7.77%	0.08398	7.81%	0.08398	7.85%	0.08398
44	7.88%	0.08398	7.92%	0.08398	7.96%	0.08398	8.00%	0.08398
45	8.04%	0.08398	8.08%	0.08398	8.12%	0.08398	8.16%	0.08398
46	8.21%	0.08398	8.25%	0.08398	8.29%	0.08398	8.33%	0.08398
47	8.38%	0.08398	8.42%	0.08398	8.47%	0.08398	8.51%	0.08398
48	8.56%	0.08398	8.60%	0.08398	8.65%	0.08398	8.70%	0.08398
49	8.74%	0.08398	8.79%	0.08398	8.84%	0.08398	8.89%	0.08398
50	8.94%	0.08398	8.98%	0.08398	9.03%	0.08398	9.08%	0.08398
51	9.13%	0.08398	9.17%	0.08398	9.20%	0.08398	9.24%	0.08398
52	9.28%	0.08398	9.30%	0.08398	9.32%	0.08398	9.35%	0.08398
53	9.37%	0.08398	9.38%	0.08398	9.39%	0.08398	9.40%	0.08398
54	9.41%	0.08398	9.42%	0.08398	9.42%	0.08398	9.42%	0.08398
55	9.42%	0.08398	9.40%	0.08398	9.38%	0.08398	9.37%	0.08398
56	9.35%	0.08398	9.31%	0.08398	9.27%	0.08398	9.23%	0.08398
57	9.19%	0.08398	9.26%	0.08398	9.34%	0.08398	9.42%	0.08398
58	9.49%	0.08398	9.58%	0.08398	9.66%	0.08398	9.74%	0.08398
59	9.82%	0.08398	9.82%	0.08398	9.82%	0.08398	9.82%	0.08398

Interest: 7.25% per annum

Mortality: **Member** - Headcount-Weighted RP-2014 Healthy Annuitant Table, projected 20 years with scale MP-2015, with no setback for males, set forward one year for females, weighted 80% Male and 20% Female  
**Beneficiary** - Headcount-Weighted RP-2014 Healthy Annuitant Table, projected 20 years with scale MP-2015, with no setback for males, set forward one year for females, weighted 20% Male and 80% Female

Salary Increase: See Exhibit II in Section 4

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix B  
Allocation of Actuarial Surplus**

	June 30	
	2017	2016
<b>Surplus as of Date of Valuation (Table 1)</b>	\$223,625,827	\$209,187,554
Actuarial Surplus (Table 1)	110,491,027	102,445,954
Distributable Actuarial Surplus as of date of valuation (Table 2)	6,809,307	6,313,507
<b>Allocation of Distributable Surplus as of Date of Valuation:</b>		
City Allocation (Table 3)	\$4,539,538	\$4,209,005
PRSB Allocation (Table 3)	<u>2,269,769</u>	<u>2,104,502</u>
Total	\$6,809,307	\$6,313,507

The Allocation of Distributable Actuarial Surplus is sufficient to:

- Only partially offset the City's contribution requirement for the 2018-2019 fiscal year from \$24,911,418 to \$20,371,880 <sup>(1)</sup> (see Table 4);
- and
- Provide a PRSB benefit of \$181.48 per month over the 2018 calendar year (see Table 5) under the current policy of 80% distribution.

<sup>(1)</sup> This amount is before considering the projected balance in the City Surplus Reserve Account.



**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix B  
Allocation of Actuarial Surplus (Continued)**

	June 30	
	2017	2016
<b>Table 1: Calculation of Actuarial Surplus</b>		
(1) Valuation Value of Assets	\$1,354,973,827	\$1,276,603,554
(2) Actuarial Accrued Liability	1,131,348,000	1,067,416,000
(3) Surplus: (1) – (2)	223,625,827	209,187,554
(4) Contingency Reserve: 10% of (2), not more than (3)	113,134,800	106,741,600
(5) Actuarial Surplus: (3) – (4)	110,491,027	102,445,954
<b>Table 2: Determination of Distributable Actuarial Surplus</b>		
(1) Actuarial Surplus (Table 1)	\$110,491,027	\$102,445,954
(2) Amortization of Balance of Actuarial Surplus:		
a. Amortization Period	25	25
b. Amortization Factor	0.061628	0.061628
c. Amortization of Balance of Actuarial Surplus (1) x (2b)	\$6,809,307	\$6,313,507

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix B  
Allocation of Actuarial Surplus (Continued)**

	June 30	
	2017	2016
<b>Table 3: Allocation of Distributable Actuarial Surplus:</b>		
(1) Distributable Actuarial Surplus	\$6,809,307	\$6,313,507
(2) City Allocation: (1) x 2/3	4,539,538	4,209,005
(3) PRSB Allocation: (1) – (2)	2,269,769	2,104,502
<p>The City Allocation (2) (along with any City Surplus Reserve and City Prepaid Contribution Accounts) is available to reduce the City’s contributions for the fiscal year that commences one year following the date of the valuation.</p> <p>The PRSB Allocations (along with the PRSB Reserve Account) is available to provide retirees, beneficiaries and DROP participants a monthly PRSB benefit during the calendar year that commences 6 months following the date of the valuation. The benefit is derived in Table 5.</p>		

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix B  
Allocation of Actuarial Surplus (Continued)**

	Fiscal Year 2018-2019			Fiscal Year 2017-2018		
	Tier 1	Tier 2	Total	Tier 1	Tier 2	Total
<b>Table 4: City Contribution Requirements Prepared using Recommended Procedure:</b>						
(1) City Normal Cost Rate	28.45%	23.07%	23.44%	28.38%	23.15%	23.64%
(2) Projected Annual Payroll	\$7,328,835	\$98,943,930	\$106,272,765	\$7,081,000	\$95,598,000	\$102,679,000
(3) City Allocation of Distributable Actuarial Surplus	379,953	4,159,585	4,539,538	350,380	3,858,625	4,209,005
(4) City Surplus Reserve Account (From Prior Years)	0	0	0	75,920	836,080	912,000
(5) ½ Year Interest on (4)	0	0	0	2,752	30,308	33,060
(6) Total Contribution Offsets (3) + (4) + (5)	379,953	4,159,585	4,539,538	429,052	4,725,013	5,154,065
(7) Total Contribution Requirement (1) * (2)	2,085,054	22,826,365	24,911,418	2,009,588	22,130,937	24,140,525
(8) City Contribution Requirement Prior To Application of Prepaid Employer Contribution Account (7) – (6), not less than 0	1,705,101	18,666,780	20,371,880	1,580,536	17,405,924	18,986,460
(9) Contribution Rate Adopted by the City for Fiscal Year 2017/2018						18.92%
(10) Projected City Contributions Based on Rate Adopted by the City (9) * (2)				1,339,725	18,087,142	19,426,867
(11) Net Additional City Contribution Before Application of Prepaid Employer Contribution Account (8) – (10)	1,705,101	18,666,780	20,371,880	240,811	-681,218	-440,407
(12) City's Prepaid Employer Contribution Account Balance (Negative Account Balance Represents Contribution Shortfall) <sup>(1)</sup>			456,372			0
(13) ½ Year Interest on (12)			16,543			0
(14) City's Fiscal Year Contribution After Application of Prepaid Employer Contribution Account (11) – (12) – (13), not less than 0	1,665,518	18,233,447	19,898,965	0	0	0
(15) Projected City Surplus Reserve Account for Future Years			0			0
(16) Projected Residual Prepaid Employer Contribution Account at Year End. (12) + (13) – (11) Adjusted with ½ Year Interest (Negative Account Balance Represents Contribution Shortfall)			0			456,372

<sup>(1)</sup> Contribution excess based on the projection of the prepaid contribution account balance

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix B  
Allocation of Actuarial Surplus (Continued)**

	June 30	
	2017	2016
<b>Table 5: Calculation of PRSB and PRSB Reserve Account:</b>		
(1) PRSB Allocation of Distributable Actuarial Surplus	\$2,269,769	\$2,104,502
(2) Distribution percentage	80%	80%
(3) Preliminary PRSB distribution: (1) x (2)	\$1,815,815	\$1,683,602
(4) Number of eligible participants (Retirees, Beneficiaries & DROP Participants)	1,142	1,118
(5) Preliminary Monthly PRSB Benefit: (3) / (4) / 12	\$132.50	\$125.49
(6) Monthly Retiree Medical Trust Premium for the calendar year that commences 6 months following the date of valuation	\$1,200.00	\$1,176.00
(7) Benefit Shortfall: (6) – (5)	\$1,067.50	\$1,050.51
(8) PRSB Reserve Account	\$1,854,000	\$1,539,000
(9) Estimated July 1 to December 31 PRSB Payments	<u>\$1,182,792</u>	<u>\$906,653</u>
(10) Net PRSB Reserve Account 6 months following the date of valuation	\$671,208	\$632,347
(11) Draw from PRSB Reserve Account (lesser of (10) / (4) / 12 or (7))	\$48.98	\$47.13
(12) Final monthly PRSB Benefit for next calendar year: (5) + (11)	\$181.48	\$172.62
(13) Estimated PRSB Reserve Account at the end of the next calendar year: (1) + (10) – [(12) * (4) * 12]	\$453,975	\$420,979

*Note: The actual, rather than the projected 2018 surplus, will be used to determine the 2019 calendar year PRSB benefit.*

**SECTION 4: Reporting Information for the City of Fresno Fire and Police Retirement System**

**Appendix C**

**UAAL Amortization Schedule as of June 30, 2017 (Dollar Amounts in Thousands)**

	<b>Date Established</b>	<b>Source</b>	<b>Initial Amount</b>	<b>Outstanding Balance</b>	<b>Years Remaining</b>	<b>Annual Payment</b>
<b>Grand Total</b>	June 30, 2017	UAAL	N/A	<u>N/A</u> <u>N/A</u>	N/A	<u>N/A</u> <u>N/A</u>

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