

Orange County Employees Retirement System

Actuarial Valuation and Review as of
December 31, 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.

Copyright © 2018 by The Segal Group, Inc. All rights reserved.



Segal Consulting
100 Montgomery Street, Suite 500 San Francisco, CA 94104
T 415.263.8200 F 415.376.1167 www.segalco.com

June 5, 2018

*Board of Retirement
Orange County Employees Retirement System
2223 Wellington Avenue
Santa Ana, CA 92701*

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of December 31, 2017. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2019/2020 and analyzes the preceding year's experience.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Plan. The census and financial information on which our calculations were based was prepared by Orange County Employees Retirement System (OCERS). That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.

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

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

Sincerely,

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

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


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


Molly Calcagno, ASA, MAAA
Assistant Actuary

MYM/jl

SECTION 1

VALUATION SUMMARY

Purpose.....	i
Significant Issues in Valuation Year ...	ii
Summary of Key Valuation Results ...	vi
Summary of Key Valuation Demographic and Financial Data	viii
Important Information about Actuarial Valuations	ix

SECTION 2

VALUATION RESULTS

A. Member Data	1
B. Financial Information	4
C. Actuarial Experience.....	7
D. Employer and Member Contributions	12
E. Funded Ratio.....	35
F. Volatility Ratios.....	37

SECTION 3

SUPPLEMENTAL INFORMATION

EXHIBIT A Table of Plan Coverage	38
EXHIBIT B Members in Active Service and Projected Average Compensation as of December 31, 2017	50
EXHIBIT C Reconciliation of Member Data – December 31, 2016 to December 31, 2017	62
EXHIBIT D Summary Statement of Income and Expenses on an Actuarial Value Basis .	63
EXHIBIT E Summary Statement of Assets	64
EXHIBIT F Actuarial Balance Sheet	65
EXHIBIT G Summary of Reported Asset Information as of December 31, 2017.....	66
EXHIBIT H Development of Unfunded/(Overfunded) Actuarial Accrued Liability for Year Ended December 31, 2017	67
EXHIBIT I Section 415 Limitations	68
EXHIBIT J Definitions of Pension Terms.....	69

SECTION 4

REPORTING INFORMATION

EXHIBIT I Summary of Actuarial Valuation Results	71
EXHIBIT II Actuarial Assumptions and Actuarial Cost Method	73
EXHIBIT III Summary of Plan Provisions.....	94
Appendix A UAAL Amortization Schedule as of December 31, 2017.....	108
Appendix B Member Contribution Rates.....	120
Appendix C Funded Percentages (by Rate Group).....	140
Appendix D Reconciliation of Employer Contribution Rates (by Rate Group).....	141
Appendix E Reconciliation of UAAL (by Rate Group).....	144

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

Purpose

This report has been prepared by Segal Consulting to present a valuation of the Orange County Employees Retirement System as of December 31, 2017. The valuation was performed to determine whether the assets and contributions are expected to be sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of OCERS, as administered by the Board of Retirement;
- The characteristics of covered active members, inactive vested members, retired members, and beneficiaries as of December 31, 2017, provided by OCERS;
- The assets of the Plan as of December 31, 2017, provided by OCERS;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the December 31, 2017 valuation; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc. adopted by the Board for the December 31, 2017 valuation.

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

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to evaluate the System's assets, liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by the 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 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. In this valuation, we have applied the Board's funding policy adopted in 2014 (and reaffirmed in 2018) to combine and re-amortize the outstanding balance of the unfunded actuarial accrued liability (UAAL) from the December 31, 2012 valuation over a declining 20-year period effective with the December 31, 2013 valuation. Any changes in UAAL due to actuarial gains or losses or due to changes in assumptions or methods will be amortized over separate 20-year periods. Any changes in UAAL due to plan amendments will be amortized over separate 15-year periods and any change in UAAL due to an early retirement incentive program will be amortized over a separate period of up to 5 years.

The rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2019 through June 30, 2020 (the rates will go into effect during the pay period which includes July 1, 2019).

Ref: Pgs. 108 - 119

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

Significant Issues in Valuation Year

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

- The results of this valuation reflect changes in the economic and non-economic assumptions as recommended by Segal and adopted by the Board for the December 31, 2017 valuation. These changes were documented in our Actuarial Experience Study dated August 14, 2017 and PowerPoint presentation dated October 16, 2017. They are also outlined in Section 4, Exhibit II of this report. These assumption changes resulted in an increase in the average employer rate of 4.81% of payroll and an increase in the aggregate member rate of 0.77% of payroll. Of the 4.81% increase in the employer rate, 1.10% is due to an increase in the Normal Cost and 3.71% is due to an increase in the UAAL rate.
- The Board approved a three-year phase-in of the UAAL employer cost impact due to assumption changes. The employer contribution rates as of December 31, 2017 have been adjusted to reflect only one-third of the UAAL cost impact.
- The ratio of the valuation value of assets to the actuarial accrued liabilities has decreased from 73.1% to 72.3%. For informational purposes only, we have also prepared in Appendix C the funded ratio for each Rate Group. The System's funded ratio measured on a market value basis increased from 70.6% to 74.6%. The System's UAAL, measured using the valuation value of assets, has increased from \$4,830.5 million as of December 31, 2016 to \$5,438.3 million as of December 31, 2017. The increase in UAAL is mainly due to (a) changes in actuarial assumptions, (b) actual contributions less than expected, and (c) other actuarial losses, offset somewhat by (d) favorable investment return (after smoothing), (e) lower than expected salary increases, (f) lower than expected COLA increases, (g) a transfer from the O.C. Sanitation District UAAL Deferred Account, and (h) additional UAAL payments made by Children and Families Commission, Law Library and OCFA. A reconciliation of the System's UAAL is provided in Section 3, Exhibit H. A schedule showing the reconciliation of the UAAL by Rate Group is provided in Appendix E.
- The aggregate employer rate calculated in this valuation has increased from 36.43% of payroll to 37.97% of payroll. The 36.43% aggregate rate was calculated after adjusting for the additional UAAL contributions made by Children and Families Commission and Law Library during 2017. The December 31, 2016 contribution rate without adjustment for the additional UAAL contributions was 36.45% of payroll.

Ref: Pgs. 36 and 140

Ref: Pgs. 67 and 144 - 145

Ref: Pgs. 33 and 141 - 143

The reasons for the increase in the aggregate employer rate between the 2016 and 2017 valuations are (a) changes in actuarial assumptions and (b) actual contributions less than expected, offset somewhat by (c) the adjustment for the three-year phase-in of the UAAL cost impact due to assumption changes, (d) favorable investment return (after smoothing), (e) lower than expected salary increases, (f) growth in total payroll more than expected, (g) lower than expected COLA increases, (h) additional UAAL payments made by Children and Families Commission, Law Library and OCFA, and (i) other actuarial gains. A reconciliation of the System's aggregate employer rate is provided in

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

Section 2, Subsection D (see Chart 15). A reconciliation of the employer contribution rate by Rate Group is provided in Appendix D.

Ref: Pg. 15

- OCERS has applied the withdrawing employer policy to Cypress Parks and Recreation. Similar to the presentation used in the December 31, 2016 valuation report, we have included a footnote to Chart 13 to show what the UAAL contribution rates would be for the other active employers in Rate Group #1 (i.e., the County and O.C. IHSS Public Authority) after adjustments to reflect the UAAL paid by U.C.I., Department of Education, and Cypress Parks and Recreation.

Ref: Pg. 108

- The UAAL amounts of \$28.533 million, \$2.848 million, and \$0.653 million allocated to U.C.I., Department of Education, and Cypress Parks and Recreation, respectively, as of December 31, 2016 were provided in our December 31, 2016 valuation report and our letter dated October 23, 2017. The UAAL amounts for U.C.I., Department of Education, and Cypress Parks and Recreation have increased to \$30.927 million, \$3.046 million, and \$0.853 million, respectively, as of December 31, 2017 primarily due to the changes in actuarial assumptions. We have not included the level dollar amount required to amortize the new UAAL under the Board's policy for employers with declining payroll. We would be glad provide such amount in a side letter if directed to do so by the Board.

Ref: Pg. 34

- The aggregate member rate calculated in this valuation has increased from 11.97% of payroll to 12.63% of payroll due to the changes in actuarial assumptions. A reconciliation of the System's aggregate member rate is provided in Section 2, Subsection D (see Chart 16).

Ref: Pg. 5

- As indicated in Section 2, Subsection B (see Chart 7) of this report, the total net unrecognized investment **gain** as of December 31, 2017 is \$455,396,000 (as compared to a net unrecognized **loss** of \$445,648,000 as of December 31, 2016). This deferred investment gain will be recognized in the determination of the actuarial value of assets for funding purposes over the next four years as shown on Line 7 of Chart 7, along with any future gains or losses that occur after December 31, 2017 if the System does not earn the assumed rate of investment return of 7.00% per year (net of expenses) on a market value basis.

The deferred gains of \$455.4 million represent about 3.1% of the market value of assets (as compared to 3.5% in deferred losses the prior valuation). The potential impact associated with the deferred investment gains may be illustrated as follows:

- If the deferred gains were recognized immediately in the valuation value of assets, the funded ratio would increase from 72.3% to 74.6%.

For comparison purposes, if all the deferred losses in the December 31, 2016 valuation had been recognized immediately in the valuation value of assets, the funded ratio would have decreased from 73.1% to 70.6%.

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

- If the deferred gains were recognized immediately in the valuation value of assets, the aggregate employer rate would decrease from 37.97% of payroll to about 36.2% of payroll.

For comparison purposes, if all the deferred losses in the December 31, 2016 valuation had been recognized immediately in the valuation value of assets, the aggregate employer rate would have increased from 36.56% of payroll to about 38.6% of payroll.

- The actuarial valuation report as of December 31, 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.
- The balance in the O.C. Sanitation District UAAL Deferred Account as of December 31, 2017 before any transfer was \$38.9 million. As of December 31, 2017, a transfer of \$24.0 million was required from this account to pay off their UAAL. The balance in the O.C. Sanitation District UAAL Deferred Account as of December 31, 2017 after the transfer is \$14.9 million.
- This report reflects the \$1.7 million additional contributions made by Children and Families Commission to pay off their UAAL as of December 31, 2016. The \$1.7 million¹ of additional contributions made by Children and Families Commission has been used to eliminate their UAAL rates starting 2018/2019. Note that because the UAAL used to determine the \$1.7 million required to pay off their UAAL included the UAAL rate credit due to the future service only benefit improvement, Children and Families Commission will no longer receive any future service only benefit improvement rate credit.

This report also reflects the \$1.5 million additional contributions made by Law Library to pay off their UAAL. The \$1.5 million² of additional contributions made by Law Library has been used to eliminate their UAAL rates starting 2018/2019.

This report also reflects the \$32.1 million additional contributions made by OCFA towards their UAAL. The \$32.1 million³ of additional contributions made by OCFA has been amortized as a level percent of pay over a period of twenty years effective on December 31, 2017 and used to reduce their UAAL rates for 2019/2020.

¹ \$1.7 million in additional contributions were made by Children and Families Commission on November 15, 2017. After adjusting with interest, those contributions have a value of \$1.8 million as of December 31, 2017.

² \$1.5 million in additional contributions were made by Law Library on December 15, 2017. After adjusting with interest, those contributions have a value of \$1.5 million as of December 31, 2017.

³ \$32.1 million in additional contributions were made by OCFA continuously throughout the year. After adjusting with interest, those contributions have a value of \$32.7 million as of December 31, 2017.

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

Impact of Future Experience on Contribution Rates

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

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

A general measure of the potential volatility in the level of required contributions from changes in the market value of assets and the actuarial accrued liability is provided in Section 2, Subsection F. A more specific review to illustrate the impact on contributions under various scenarios of one-year deviation in market return will be provided in a separate report later this year.

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

Summary of Key Valuation Results (Dollar Amounts in Thousands)

	December 31, 2017		December 31, 2016	
	Total Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Total Rate ⁽³⁾	Estimated Annual Amount ⁽²⁾
Aggregate Employer Contribution Rates:				
<u>General</u>				
Rate Group #1 – Plans A, B and U (non-OCTA, non-OCSD)	18.27%	\$15,287	16.37%	\$13,701
Rate Group #2 – Plans I, J, O, P, S, T, U and W (County et al.)	35.33%	386,218	33.34%	364,426
Rate Group #3 – Plans B, G, H and U (OCSD)	12.46%	8,615	11.42%	7,896
Rate Group #5 – Plans A, B and U (OCTA)	27.96%	28,725	25.47%	26,164
Rate Group #9 – Plans M, N and U (TCA)	24.51%	1,794	23.53%	1,721
Rate Group #10 – Plans I, J, M, N and U (OCFA)	28.96%	7,731	30.40%	8,115
Rate Group #11 – Plans M and N, future service, and U (Cemetery)	12.48%	205	10.81%	177
Rate Group #12 – Plans G, H, future service, and U (Law Library)	13.85%	155	13.14%	147
<u>Safety</u>				
Rate Group #6 – Plans E, F and V (Probation)	52.32%	\$33,518	47.81%	\$30,629
Rate Group #7 – Plans E, F, Q, R and V (Law Enforcement)	62.38%	147,440	62.39%	147,475
Rate Group #8 – Plans E, F, Q, R and V (OCFA)	46.24%	58,307	47.31%	59,654
<u>All Groups Combined</u>	37.97%	\$687,995	36.43%	\$660,105
Average Member Contribution Rates:				
<u>General</u>				
Rate Group #1 – Plans A, B and U (non-OCTA, non-OCSD)	9.61%	\$8,041	8.66%	\$7,246
Rate Group #2 – Plans I, J, O, P, S, T, U and W (County et al.)	11.56%	126,356	10.98%	120,016
Rate Group #3 – Plans B, G, H and U (OCSD)	12.13%	8,387	11.35%	7,847
Rate Group #5 – Plans A, B and U (OCTA)	10.10%	10,376	9.34%	9,595
Rate Group #9 – Plans M, N and U (TCA)	10.92%	799	10.21%	747
Rate Group #10 – Plans I, J, M, N and U (OCFA)	11.84%	3,160	10.97%	2,928
Rate Group #11 – Plans M and N, future service, and U (Cemetery)	9.98%	163	9.15%	150
Rate Group #12 – Plans G, H, future service, and U (Law Library)	13.67%	153	12.77%	143
<u>Safety</u>				
Rate Group #6 – Plans E, F and V (Probation)	16.55%	\$10,602	15.50%	\$9,930
Rate Group #7 – Plans E, F, Q, R and V (Law Enforcement)	17.15%	40,538	16.46%	38,907
Rate Group #8 – Plans E, F, Q, R and V (OCFA)	16.11%	20,313	15.39%	19,405
<u>All Groups Combined</u>	12.63%	\$228,888	11.97%	\$216,914

(1) These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

(2) Based on December 31, 2017 projected annual compensation.

(3) For those Rate Groups with tier specific contribution rates, the total rates shown above have been recalculated by applying the tier specific contribution rates determined in the December 31, 2016 valuation to the corresponding projected payrolls reported as of December 31, 2017.

(4) Average rates have been recalculated by applying the individual entry age based rates determined in the December 31, 2016 valuation to the System membership as of December 31, 2017.

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

Summary of Key Valuation Results (Dollar Amounts in Thousands)

	December 31, 2017	December 31, 2016
Funded Status:		
Actuarial accrued liability (AAL)	\$19,635,427	\$17,933,461
Valuation value of assets (VVA) ⁽¹⁾	14,197,125	13,102,978
Market value of assets (MVA) ^{(1),(2)}	14,652,521	12,657,330
Funded percentage on a VVA basis	72.30%	73.06%
Funded percentage on a MVA basis	74.62%	70.58%
Unfunded Actuarial Accrued Liability on a VVA basis	\$5,438,302	\$4,830,483
Unfunded Actuarial Accrued Liability on a MVA basis	4,982,906	5,276,131
Key Assumptions:		
Interest rate	7.00%	7.25%
Inflation rate	2.75%	3.00%
Across-the-board real salary increase	0.50%	0.50%

⁽¹⁾ Excludes County Investment Account (funded by pension obligation bond proceeds held by OCERS), prepaid employer contributions account, O.C. Sanitation District UAAL Deferred Account (after transfer) and non-valuation reserves.

⁽²⁾ Based on the preliminary unaudited financial statement provided by OCERS for this valuation.

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

Summary of Key Valuation Demographic and Financial Data

	December 31, 2017	December 31, 2016	Change
Active Members:			
Number of members	21,721	21,746	-0.1%
Average age	45.3	45.4	-0.1
Average service	12.9	12.9	0.0
Projected total compensation	\$1,811,879,510	\$1,759,833,297	3.0%
Average projected compensation	\$83,416	\$80,927	3.1%
Retired Member and Beneficiaries:			
Number of members:			
Service retired	13,240	12,767	3.7%
Disability retired	1,446	1,419	1.9%
Beneficiaries	<u>2,261</u>	<u>2,183</u>	3.6%
Total	16,947	16,369	3.5%
Average age	69.8	69.7	0.1
Average monthly benefit ⁽¹⁾	\$3,745	\$3,637	3.0%
Vested Terminated Members:			
Number of vested terminated members ⁽²⁾	5,803	5,370	8.1%
Average age	44.8	44.8	0.0
Summary of Financial Data (dollar amounts in thousands):			
Market value of assets ⁽³⁾	\$14,652,607	\$12,657,418	15.8%
Return on market value of assets	14.79%	8.72%	N/A
Actuarial value of assets ⁽³⁾	\$14,197,211	\$13,103,066	8.4%
Return on actuarial value of assets	7.44%	6.33%	N/A
Valuation value of assets ⁽³⁾	\$14,197,125	\$13,102,978	8.4%
Return on valuation value of assets	7.44%	6.33%	N/A

⁽¹⁾ Excludes monthly benefits payable from the STAR COLA.

⁽²⁾ This includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽³⁾ The market value excludes \$134,417,000 and \$117,723,000 as of December 31, 2017 and December 31, 2016, respectively, in the County Investment Account (funded by pension obligation bond proceeds held by OCERS), \$244,552,000 and \$222,524,000 as of December 31, 2017 and December 31, 2016, respectively, in the prepaid employer contributions account and \$14,871,000 and \$34,067,000 as of December 31, 2017 and December 31, 2016, respectively, in the O.C. Sanitation District UAAL Deferred Account (after transfer as of December 31, 2017).

Note that the above market values and actuarial values include the non-valuation reserves, which are excluded from the valuation values.

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

Important Information about Actuarial Valuations

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

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

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan description in this report to confirm that Segal has correctly interpreted the plan provisions.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by OCERS. 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 OCERS.
- **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 OCERS. 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

SECTION 1: Valuation Summary for the Orange County Employees Retirement System

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

- If OCERS is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.

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

SECTION 2: Valuation Results for the Orange County Employees 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

Year Ended December 31	Active Members	Vested Terminated Members⁽¹⁾	Retired Members and Beneficiaries	Ratio of Non-Actives to Actives
2008	23,720	3,881	11,778	0.66
2009	22,633	4,094	12,243	0.72
2010	21,742	4,308	12,762	0.79
2011	21,421	4,406	13,289	0.83
2012	21,256	4,415	13,947	0.86
2013	21,368	4,613	14,505	0.89
2014	21,459	4,789	15,169	0.93
2015	21,525	5,091	15,810	0.97
2016	21,746	5,370	16,369	1.00
2017	21,721	5,803	16,947	1.05

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

SECTION 2: Valuation Results for the Orange County Employees Retirement System

Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 21,721 active members with an average age of 45.3, average years of service of 12.9 years, and average compensation of \$83,416. The 21,746 active members in the prior valuation had an average age of 45.4, average service of 12.9 years, and average compensation of \$80,927.

Inactive Members

In this year's valuation, there were 5,803 members with a vested right to a deferred or immediate vested benefit or entitled to a return of their member contributions versus 5,370 in the prior valuation.

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

CHART 2
Distribution of Active Members by Age as of December 31, 2017

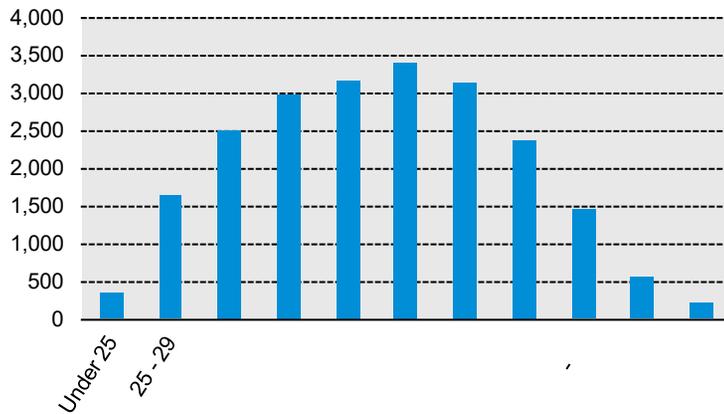
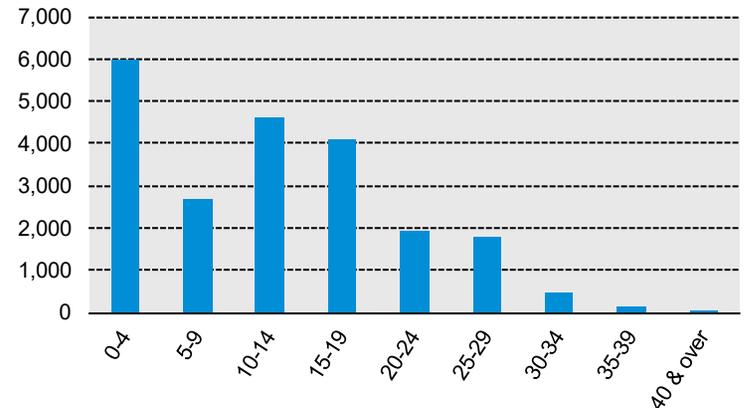


CHART 3
Distribution of Active Members by Years of Service as of December 31, 2017



SECTION 2: Valuation Results for the Orange County Employees Retirement System

Retired Members and Beneficiaries

As of December 31, 2017, 14,686 retired members and 2,261 beneficiaries were receiving total monthly benefits of \$63,464,718. For comparison, in the previous valuation, there were 14,186 retired members and 2,183 beneficiaries receiving total monthly benefits of \$59,529,794. These monthly benefits exclude benefits payable from the Supplemental Targeted Adjustment for Retirees Cost of Living Adjustment (STAR COLA).

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 December 31, 2017

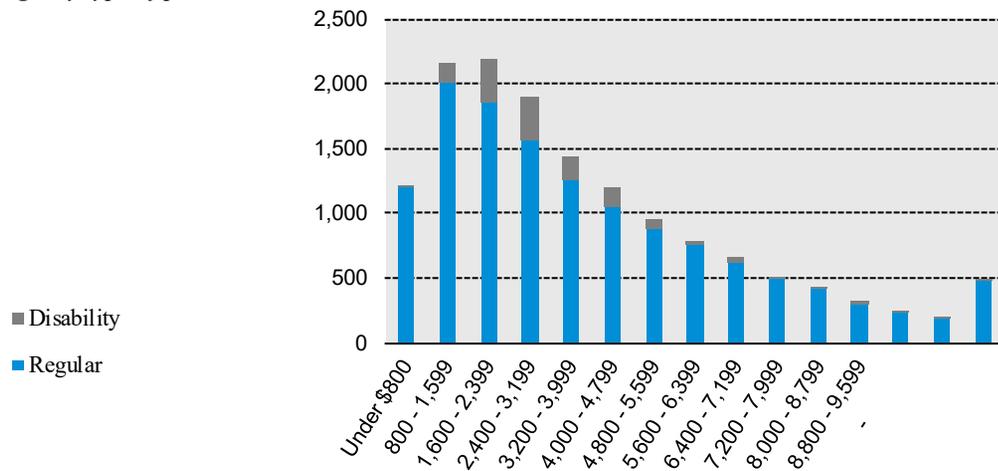
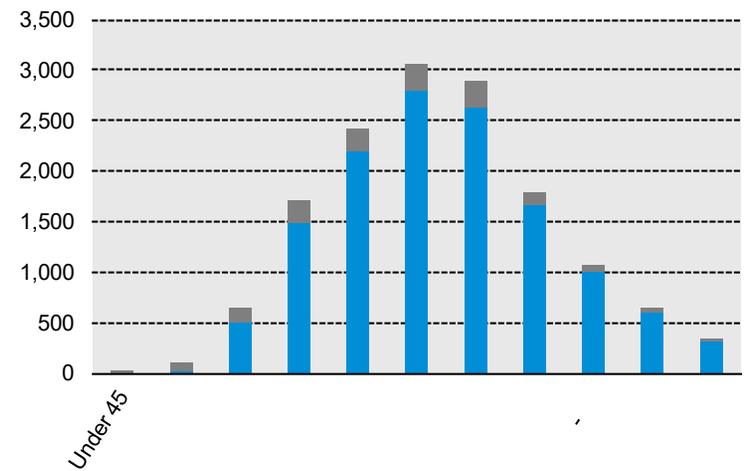


CHART 5
Distribution of Retired Members (Excl. Beneficiaries) by Type and by Age as of December 31, 2017



SECTION 2: Valuation Results for the Orange County Employees Retirement System

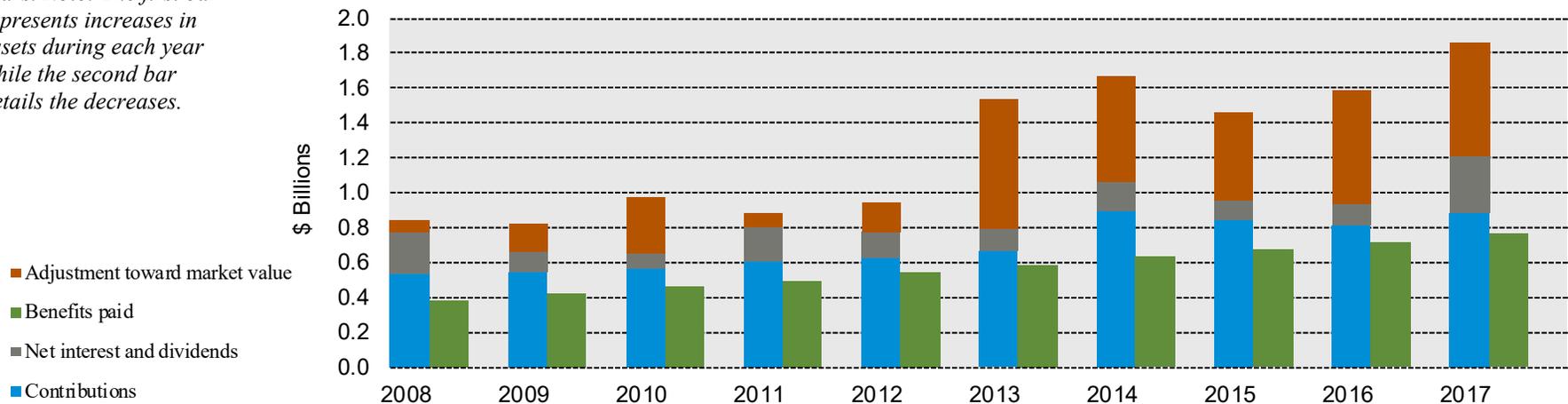
B. FINANCIAL INFORMATION

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 past 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 December 31, 2008 – 2017



SECTION 2: Valuation Results for the Orange County Employees Retirement System

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 does not have an immediate effect on the actuarial value of assets. The determination of the Actuarial Value of Assets and Valuation Value of Assets is provided below.

CHART 7

Determination of Actuarial and Valuation Value of Assets for Year Ended December 31, 2017

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

Plan Year Ending	Total Actual Market Return (net)	Expected Market Return (net)	Investment Gain / (Loss)	Deferred Factor	Deferred Return
2013	\$1,031,118,000	\$696,553,000	\$334,565,000	0.0	\$0
2014	487,104,000	780,627,000	(293,523,000)	0.2	(58,705,000)
2015	(51,601,000)	833,757,000	(885,358,000)	0.4	(354,143,000)
2016	1,010,548,000	840,469,000	170,079,000	0.6	102,047,000
2017	1,878,172,000	920,426,000	957,746,000	0.8	<u>766,197,000</u>
1. Total Deferred Return					\$455,396,000
2. Net Market Value Of Assets (Excludes \$134,417,000 in County Investment Account (funded by pension obligation bond proceeds held by OCERS), \$244,552,000 in Prepaid Employer Contributions and \$14,871,000 ⁽¹⁾ in O.C. Sanitation District UAAL Deferred Account)					\$14,652,607,000 ⁽²⁾
3. Actuarial Value of Assets (2) – (1)					\$14,197,211,000
4. Ratio of Actuarial Value To Market Value (3) / (2)					96.9%
5. Non-valuation Reserves					
(a) Unclaimed member deposit					\$0
(b) Medicare medical insurance reserve					<u>86,000</u>
(c) Subtotal					\$86,000
6. Valuation value of assets (3) – (5)(c)					\$14,197,125,000
7. Deferred Return Recognized in Each of the Next 4 years					
(a) Amount recognized on 12/31/2018					\$(10,211,000)
(b) Amount recognized on 12/31/2019					48,493,000
(c) Amount recognized on 12/31/2020					225,565,000
(d) Amount recognized on 12/31/2021					<u>191,549,000</u>
(e) Subtotal (may not total exactly due to rounding)					\$455,396,000

⁽¹⁾ After reflecting asset transfer of \$24,042,000 from O.C. Sanitation District UAAL Deferred Account to valuation assets as of December 31, 2017.

⁽²⁾ Based on the preliminary unaudited financial statement provided by OCERS for this valuation.

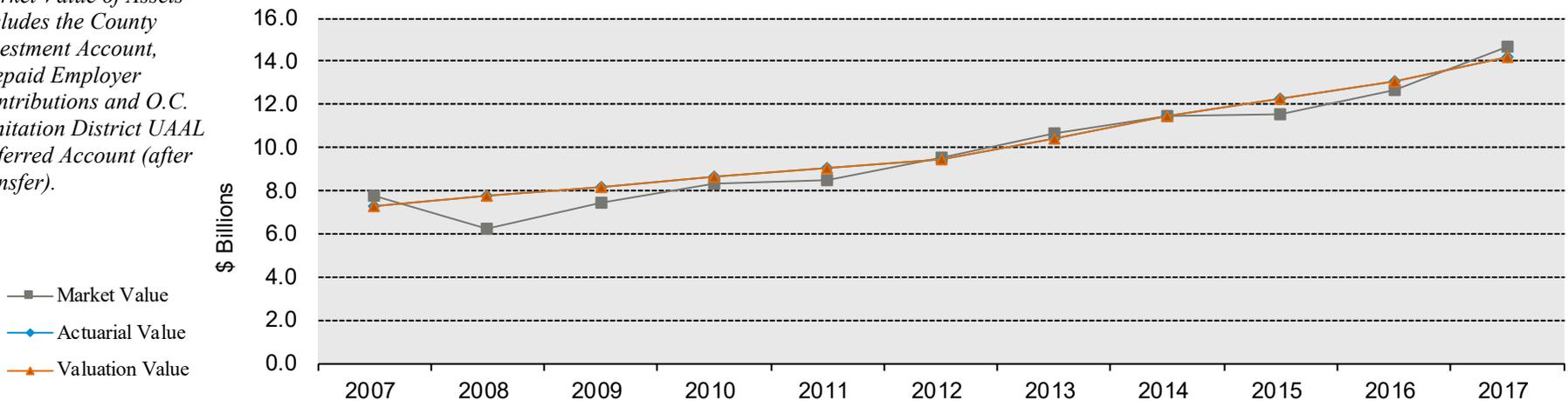
SECTION 2: Valuation Results for the Orange County Employees Retirement System

The market value, actuarial value, and valuation value of assets are representations of OCERS' 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 OCERS' liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

This chart shows the change in market value, actuarial value and valuation value over the past eleven years. Note: Market Value of Assets excludes the County Investment Account, Prepaid Employer Contributions and O.C. Sanitation District UAAL Deferred Account (after transfer).

CHART 8

Market Value, Actuarial Value and Valuation Value of Assets as of December 31, 2007 – 2017



SECTION 2: Valuation Results for the Orange County Employees Retirement System

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 \$191.9 million, reflecting a gain of \$24.4 million from investments, a net gain of \$22.7 million from contribution experience (including a gain of \$36.4 million from additional UAAL payments, a gain of \$24.0 million transfer from O.C. Sanitation District UAAL Deferred Account and a loss of \$37.7 million from all other contribution experience) and a gain of \$144.8 million from all other sources. 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.

CHART 9

Actuarial Experience for Year Ended December 31, 2017 (Dollar Amounts in Thousands)

1. Net gain/(loss) from investments ⁽¹⁾	\$24,401,000
2. Net gain/(loss) from contribution experience	22,664,000
3. Net gain/(loss) from other experience ⁽²⁾	<u>144,847,000</u>
4. Net experience gain/(loss): (1) + (2) + (3)	<u>\$191,912,000</u>

⁽¹⁾ Details in Chart 10.

⁽²⁾ See Section 3, Exhibit H.

SECTION 2: Valuation Results for the Orange County Employees 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 OCERS’ investment policy. For valuation purposes, the assumed rate of return on the valuation value of assets was 7.25% (based on the December 31, 2016 valuation). The actual rate of return on a valuation basis for the 2017 plan year was 7.44%.

Since the actual return for the year was greater than the assumed return, OCERS experienced an actuarial gain during the year ended December 31, 2017 with regard to its investments.

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

**CHART 10
Investment Experience for Year Ended December 31, 2017 – Valuation Value, Actuarial Value and Market Value of Assets**

	Valuation Value	Actuarial Value	Market Value
1. Actual return	\$977,130,000	\$977,128,000	\$1,878,172,000
2. Average value of assets	\$13,141,089,000	\$13,141,177,000	\$12,695,529,000
3. Actual rate of return: (1) ÷ (2)	7.44%	7.44%	14.79%
4. Assumed rate of return	7.25%	7.25%	7.25%
5. Expected return: (2) x (4)	\$952,729,000	\$952,735,000	\$920,426,000
6. Actuarial gain/(loss): (1) – (5)	<u>\$24,401,000</u>	<u>\$24,393,000</u>	<u>\$957,746,000</u>

SECTION 2: Valuation Results for the Orange County Employees 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 valuation, actuarial and market basis for the last ten years.

CHART 11

Investment Return – Valuation Value, Actuarial Value and Market Value: 2008 - 2017 (Dollar Amounts in Thousands)

Year Ended December 31	Valuation Value Investment Return		Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent
2008	\$312,821	4.25%	\$311,887	4.23%	\$(1,617,791)	-20.76%
2009	282,764	3.62%	281,360	3.60%	1,092,660	17.32%
2010	412,046	5.02%	411,960	5.02%	787,215	10.47%
2011	287,241	3.29%	286,585	3.28%	3,236	0.04%
2012	318,043	3.49%	318,033	3.49%	1,014,471	11.92%
2013	866,402	9.11%	866,402	9.11%	1,031,118	10.73%
2014	771,174	7.34%	771,049	7.34%	487,104	4.52%
2015	606,191	5.26%	606,190	5.26%	(51,601)	-0.45%
2016	776,628	6.33%	776,627	6.33%	1,010,548	8.72%
2017	977,130	7.44%	977,128	7.44%	1,878,172	14.79%
5-Year Average Return		7.09%		7.09%		7.53%
10-Year Average Return		5.50%		5.49%		5.16%

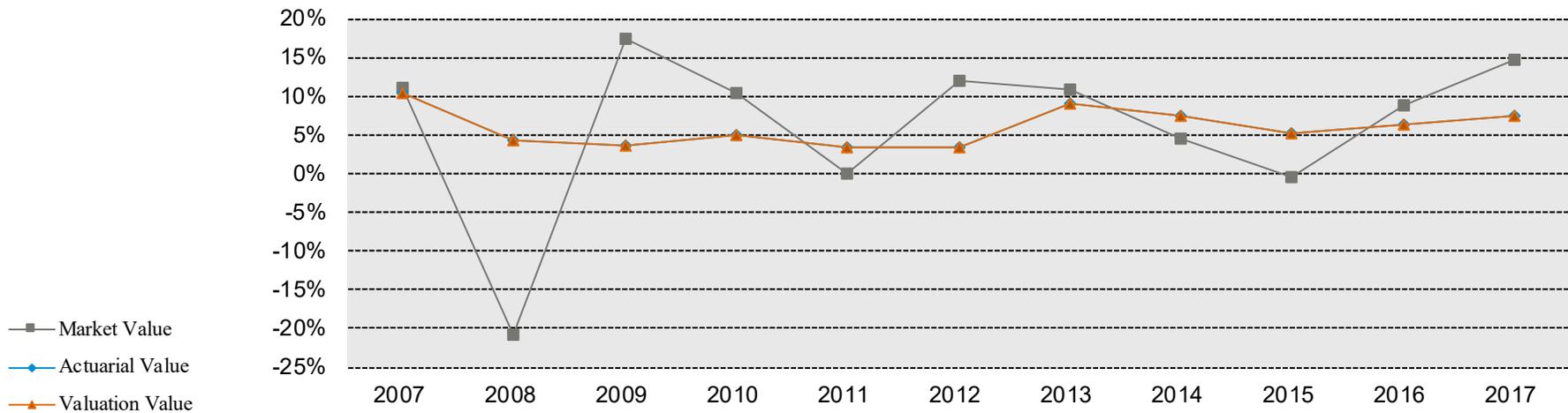
Note: The dollar amount of return on market value is net of the return on the County Investment Account (funded by pension obligation bond proceeds held by OCERS), prepaid employer contributions account and O.C. Sanitation District UAAL Deferred Account (after transfer). Furthermore, due to differences in how returns are calculated, these market value rates of return will generally differ somewhat from the return reported by OCERS and its investment consultant.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

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.

This chart illustrates how this leveling effect has actually worked over the past eleven years.

CHART 12
Market, Actuarial, and Valuation Value Rates of Return for Years Ended December 31, 2007 – 2017



SECTION 2: Valuation Results for the Orange County Employees Retirement System

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, and
- salary increases different than assumed.

The net gain from this other experience for the year ended December 31, 2017 amounted to \$144.8 million which is 0.74% of the actuarial accrued liability. See Exhibit H in Section 3 for a detailed development of the unfunded actuarial accrued liability.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

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.

For Probation Safety members who have prior benefit service in the other OCERS plan, the normal cost rate for their current plan is calculated based on the entry date for their current plan.

Contribution to the Unfunded

Actuarial Accrued Liability (UAAL)

The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution (or rate credit in the case of a negative unfunded 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 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 3.25% (i.e., 2.75% inflation plus 0.50% across-the-board salary increase). The outstanding balance of the December 31, 2012 UAAL was combined and re-amortized over a declining 20-year period effective with the December 31, 2013 valuation. Any changes in UAAL due to actuarial gains or losses or due to changes in assumptions or methods will be amortized over separate 20-year periods. Any changes in UAAL due to plan amendments will be amortized over separate 15-year periods and any change in UAAL due to early retirement incentive programs will be amortized over a separate period of up to 5 years.

The recommended employer contributions are provided in Chart 13.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

Member Contributions

Non-CalPEPRA Members

Articles 6 and 6.8 of the 1937 Act define the methodology to be used in the calculation of member basic contribution rates for General members and Safety members, respectively. The basic contribution rate is determined so that the accumulation of a member's basic contributions made in a given year until a certain age will be sufficient to fund an annuity at that age that is equal to:

- 1/200 of Final Average Salary for General Plan A;
- 1/120 of Final Average Salary for General Plan B;
- 1/100 of Final Average Salary for General Plans G, H, I, J, and S;
- 1/120 of Final Average Salary for General Plans M, N, O, and P;
- 1/200 of Final Average Salary for Safety Plans E and Q, and;
- 1/100 of Final Average Salary for Safety Plans F and R.

The annuity age is 60 for General Plans A, B, M, N, O, P and S, 55 for Plans G, H, I, and J, and 50 for Safety Plans E, F, Q, and R. It is assumed that contributions are made annually at the same rate, starting at entry age.

In addition to the basic contributions, members also pay one-half of the total normal cost necessary to fund cost-of-living benefits which is calculated separately for each rate group, with the exception of Rate Groups #9 and #11, which are developed on a combined or pooled basis as described in our Cost Sharing Structure letter dated July 30, 2010. Within each rate group, the COLA normal cost is either pooled for Tiers 1 and 2 because the same 3% COLA is provided for both Tiers, or it differs by a set formula based on past practice we carried over from the OCERS' prior actuary. Accumulation includes crediting of interest at the assumed investment earnings rate.

Effective with the December 31, 2014 valuation, for determining the cost of the total benefit (i.e., basic and COLA components), the effect of the assumed additional cashouts are recognized in the valuation as an employer and member cost.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CalPEPRA Members

Pursuant to Section 7522.30(a) of the Government Code, CalPEPRA members in Plans T, U, V and W are required to contribute at least 50% of the Normal Cost rate. We have assumed that exactly 50% of the Normal Cost would be paid by the new members. Also of note is that based on our recommendation, OCERS decided to use the discretion made available by AB1380 to not round the member's contribution rate to the nearest $\frac{1}{4}\%$ as previously required by the California Public Employees' Pension Reform Act of 2013 (CalPEPRA).

Note that for members in Plan T and Plan W, their basic rates have been calculated using a methodology similar to that used for Plan P. For members in Plan U or Plan V, their basic rates have been calculated using a methodology outlined in our letter dated December 4, 2012 that was previously approved by the Board.

Member contribution rates are provided in Appendix B.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #1 – Plans A and B (2.0% @ 57 and 1.6667% @ 57.5 – non-OCTA, non-OCSD)				
Normal Cost	10.73%	\$5,049	9.51%	\$4,475
UAAL ^{(3),(4),(5)}	<u>7.89%</u>	<u>3,713</u>	<u>7.25%</u>	<u>3,411</u>
Total Contribution	18.62%	\$8,762	16.76%	\$7,886
Rate Group #1 – Plan U (2.5% @ 67 PEPR A)⁽⁶⁾				
Normal Cost	9.93%	\$3,636	8.63%	\$3,160
UAAL ^{(3),(4),(5)}	<u>7.89%</u>	<u>2,889</u>	<u>7.25%</u>	<u>2,655</u>
Total Contribution	17.82%	\$6,525	15.88%	\$5,815
Rate Group #1 – Plans A, B and U Combined				
Normal Cost	10.38%	\$8,685	9.12%	\$7,635
UAAL ^{(3),(4),(5)}	<u>7.89%</u>	<u>6,602</u>	<u>7.25%</u>	<u>6,066</u>
Total Contribution	18.27%	\$15,287	16.37%	\$13,701

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁴⁾ The net UAAL contribution rates for County and IHSS Public Authority when calculated after excluding the UAAL for Cypress Parks and Recreation, U.C.I. and Department of Education is 4.61% for the December 31, 2017 valuation.

⁽⁵⁾ The net UAAL contribution rates for County and IHSS Public Authority when calculated after excluding the UAAL for U.C.I. and Department of Education is 4.18% for the December 31, 2016 valuation.

⁽⁶⁾ Applicable for members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #2 – Plans I and J (2.7% @ 55 – non-OCFA, non-Children and Families Commission)				
Normal Cost	14.39%	\$119,837	13.19%	\$109,844
UAAL ⁽³⁾	<u>22.67%</u>	<u>188,792</u>	<u>21.72%</u>	<u>180,880</u>
Total Contribution	37.06%	\$308,629	34.91%	\$290,724
Rate Group #2 – Plans I and J (2.7% @ 55 – non-OCFA, Children and Families Commission)				
Normal Cost	14.39%	\$75	13.19%	\$68
UAAL ^{(3),(4)}	<u>1.04%</u>	<u>5</u>	<u>0.00%</u> ⁽⁵⁾	<u>0</u>
Total Contribution	15.43%	\$80	13.19%	\$68
Rate Group #2 – Plans O and P (1.62% @ 65)				
Normal Cost	6.21%	\$926	5.53%	\$825
UAAL ⁽³⁾	<u>22.67%</u>	<u>3,381</u>	<u>21.72%</u>	<u>3,239</u>
Total Contribution	28.88%	\$4,307	27.25%	\$4,064
Rate Group #2 – Plan S (2.0% @ 57)				
Normal Cost	11.51%	\$235	10.35%	\$211
UAAL ⁽³⁾	<u>22.67%</u>	<u>462</u>	<u>21.72%</u>	<u>443</u>
Total Contribution	34.18%	\$697	32.07%	\$654

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁴⁾ UAAL rate has been adjusted to reflect future service only benefit improvement under 2.7% @ 55.

⁽⁵⁾ These rates are after adjustment to the contribution rates for the FY 18-19 for additional UAAL contributions made during calendar year 2017.

Note: For employers with future service only benefit improvements under 2.7% @ 55 (including Local Agency Formation Commission and Orange County Employees Retirement System but excluding Children and Families Commission), refer to the employer rates on page 29.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #2 – Plan T (1.62% @ 65 PEPRAs)⁽⁵⁾				
Normal Cost	7.11%	\$15,970	6.58%	\$14,779
UAAL ⁽³⁾	<u>22.67%</u>	<u>50,918</u>	<u>21.72%</u>	<u>48,785</u>
Total Contribution	29.78%	\$66,888	28.30%	\$63,564
Rate Group #2 – Plan U (2.5% @ 67 PEPRAs, non-Children and Families Commission)⁽⁶⁾				
Normal Cost	8.78%	\$1,543	8.28%	\$1,455
UAAL ⁽³⁾	<u>22.67%</u>	<u>3,983</u>	<u>21.72%</u>	<u>3,816</u>
Total Contribution	31.45%	\$5,526	30.00%	\$5,271
Rate Group #2 – Plan U (2.5% @ 67 PEPRAs, Children and Families Commission)⁽⁶⁾				
Normal Cost	8.78%	\$41	8.28%	\$39
UAAL ^{(3),(4)}	<u>1.04%</u>	<u>5</u>	<u>0.00%⁽⁷⁾</u>	<u>0</u>
Total Contribution	9.82%	\$46	8.28%	\$39

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁴⁾ UAAL rate has been adjusted to reflect future service only benefit improvement under 2.7% @ 55.

⁽⁵⁾ Applicable for members hired on or after January 1, 2013 except for County Attorneys, San Juan Capistrano members, OCERS management members and Children and Families members.

⁽⁶⁾ Applicable for County Attorneys, San Juan Capistrano members, OCERS management members and Children and Families members hired on or after January 1, 2013.

⁽⁷⁾ These rates are after adjustment to the contribution rates for the FY 18-19 for additional UAAL contributions made during calendar year 2017.

Note: For employers with future service only benefit improvements under 2.7% @ 55 (including Local Agency Formation Commission and Orange County Employees Retirement System but excluding Children and Families Commission), refer to the employer rates on page 29.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #2 – Plan W (1.62% @ 65 PEPR A)^{(4),(5)}				
Normal Cost	8.56%	\$12	6.68%	\$10
UAAL ⁽³⁾	<u>22.67%</u>	<u>33</u>	<u>21.72%</u>	<u>32</u>
Total Contribution	31.23%	\$45	28.40%	\$42
Rate Group #2 – Plans I, J, O, P, S, T, U and W Combined				
Normal Cost	12.68%	\$138,639	11.64%	\$127,231
UAAL ⁽³⁾	<u>22.65%</u>	<u>247,579</u>	<u>21.70%</u>	<u>237,195</u>
Total Contribution	35.33%	\$386,218	33.34%	\$364,426

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁴⁾ Applicable for San Juan Capistrano members hired on or after January 1, 2016 if they elect to be covered under Plan W (1.62% @ 65 formula).

⁽⁵⁾ No active members were reported for Plan W in the December 31, 2016 valuation. An entry age of 35, based on hypothetical demographic profile in our letter dated October 8, 2015 was used to estimate the Normal Cost rate. However, based on 1 employee reported in the December 31, 2017 valuation, the entry age was 57.

Note: For employers with future service only benefit improvements under 2.7% @ 55 (including Local Agency Formation Commission and Orange County Employees Retirement System but excluding Children and Families Commission), refer to the employer rates on page 29.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	<u>Rate</u> ⁽¹⁾	<u>Estimated Annual Amount</u> ⁽²⁾	<u>Rate</u>	<u>Estimated Annual Amount</u> ⁽²⁾
Rate Group #3 – Plans G and H (2.5% @ 55 – OCSD)				
Normal Cost	13.30%	\$6,312	12.28%	\$5,828
UAAL	<u>0.00%</u>	<u>0</u>	<u>0.00%</u>	<u>0</u>
Total Contribution	13.30%	\$6,312	12.28%	\$5,828
Rate Group #3 – Plan B (1.64% @ 57 – OCSD)				
Normal Cost	11.25%	\$699	10.21%	\$634
UAAL	<u>0.00%</u>	<u>0</u>	<u>0.00%</u>	<u>0</u>
Total Contribution	11.25%	\$699	10.21%	\$634
Rate Group #3 – Plan U (2.5% @ 67 PEPR A)⁽³⁾				
Normal Cost	10.37%	\$1,604	9.27%	\$1,434
UAAL	<u>0.00%</u>	<u>0</u>	<u>0.00%</u>	<u>0</u>
Total Contribution	10.37%	\$1,604	9.27%	\$1,434
Rate Group #3 – Plans B, G, H and U Combined				
Normal Cost	12.46%	\$8,615	11.42%	\$7,896
UAAL	<u>0.00%</u>	<u>0</u>	<u>0.00%</u>	<u>0</u>
Total Contribution	12.46%	\$8,615	11.42%	\$7,896

⁽¹⁾ These rates are after adjustment for \$24,042,000 asset transfer from O.C. Sanitation District UAAL Deferred Account.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ Applicable for members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #5 – Plans A and B (2.0% @ 57 and 1.6667% @ 57.5 – OCTA)				
Normal Cost	12.10%	\$11,166	10.76%	\$9,930
UAAL ⁽³⁾	<u>15.94%</u>	<u>14,710</u>	<u>14.76%</u>	<u>13,621</u>
Total Contribution	28.04%	\$25,876	25.52%	\$23,551
Rate Group #5 – Plan U (2.5% @ 67 PEPR)⁽⁴⁾				
Normal Cost	11.32%	\$1,183	10.25%	\$1,071
UAAL ⁽³⁾	<u>15.94%</u>	<u>1,666</u>	<u>14.76%</u>	<u>1,542</u>
Total Contribution	27.26%	\$2,849	25.01%	\$2,613
Rate Group #5 – Plans A, B and U Combined				
Normal Cost	12.02%	\$12,349	10.71%	\$11,001
UAAL ⁽³⁾	<u>15.94%</u>	<u>16,376</u>	<u>14.76%</u>	<u>15,163</u>
Total Contribution	27.96%	\$28,725	25.47%	\$26,164

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁴⁾ Applicable for members hired on or after January 1, 2015.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #9 – Plans M and N (2.0% @ 55 – TCA)				
Normal Cost	14.51%	\$611	13.30%	\$560
UAAL ⁽³⁾	<u>11.49%</u>	<u>484</u>	<u>11.46%</u>	<u>482</u>
Total Contribution	26.00%	\$1,095	24.76%	\$1,042
Rate Group #9 – Plan U (2.5% @ 67 PEPR)⁽⁴⁾				
Normal Cost	11.02%	\$342	10.40%	\$323
UAAL ⁽³⁾	<u>11.49%</u>	<u>357</u>	<u>11.46%</u>	<u>356</u>
Total Contribution	22.51%	\$699	21.86%	\$679
Rate Group #9 – Plans M, N and U Combined				
Normal Cost	13.02%	\$953	12.07%	\$883
UAAL ⁽³⁾	<u>11.49%</u>	<u>841</u>	<u>11.46%</u>	<u>838</u>
Total Contribution	24.51%	\$1,794	23.53%	\$1,721

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁴⁾ Applicable for members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #10 – Plans I and J (2.7% @ 55 – OCFA)				
Normal Cost	14.72%	\$2,183	13.61%	\$2,018
UAAL ⁽³⁾	<u>15.74%</u>	<u>2,334</u>	<u>18.35%</u>	<u>2,721</u>
Total Contribution	30.46%	\$4,517	31.96%	\$4,739
Rate Group #10 – Plans M and N (2.0% @ 55 – OCFA)				
Normal Cost	13.46%	\$491	12.64%	\$461
UAAL ⁽³⁾	<u>15.74%</u>	<u>575</u>	<u>18.35%</u>	<u>670</u>
Total Contribution	29.20%	\$1,066	30.99%	\$1,131
Rate Group #10 – Plan U (2.5% @ 67 PEPR A)⁽⁴⁾				
Normal Cost	10.41%	\$855	8.99%	\$738
UAAL ⁽³⁾	<u>15.74%</u>	<u>1,293</u>	<u>18.35%</u>	<u>1,507</u>
Total Contribution	26.15%	\$2,148	27.34%	\$2,245
Rate Group #10 – Plans I, J, M, N and U Combined				
Normal Cost	13.22%	\$3,529	12.05%	\$3,217
UAAL ⁽³⁾	<u>15.74%</u>	<u>4,202</u>	<u>18.35%</u>	<u>4,898</u>
Total Contribution	28.96%	\$7,731	30.40%	\$8,115

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁴⁾ Applicable for members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #11 – Plans M and N, future service (2.0% @ 55 – Cemetery)				
Normal Cost	11.98%	\$155	11.09%	\$143
UAAL ⁽³⁾	<u>0.48%</u>	<u>6</u>	<u>0.00%</u>	<u>0</u>
Total Contribution	12.46%	\$161	11.09%	\$143
Rate Group #11 – Plan U (2.5% @ 67 PEPRU)⁽⁴⁾				
Normal Cost	12.03%	\$42	9.98%	\$34
UAAL ⁽³⁾	<u>0.48%</u>	<u>2</u>	<u>0.00%</u>	<u>0</u>
Total Contribution	12.51%	\$44	9.98%	\$34
Rate Group #11 – Plans M, N and U Combined				
Normal Cost	12.00%	\$197	10.81%	\$177
UAAL ⁽³⁾	<u>0.48%</u>	<u>8</u>	<u>0.00%</u>	<u>0</u>
Total Contribution	12.48%	\$205	10.81%	\$177

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁴⁾ Applicable for members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #12 – Plans G and H, future service (2.5% @ 55 – Law Library)				
Normal Cost	14.11%	\$151	13.32%	\$143
UAAL ^{(3),(4)}	<u>0.00%</u>	<u>0</u>	<u>0.00%</u> ⁽⁵⁾	<u>0</u>
Total Contribution	14.11%	\$151	13.32%	\$143
Rate Group #12– Plan U (2.5% @ 67 PEPR A)⁽⁶⁾				
Normal Cost	9.36% ⁽⁷⁾	\$4	7.59%	\$4
UAAL ^{(3),(4)}	<u>0.00%</u>	<u>0</u>	<u>0.00%</u> ⁽⁵⁾	<u>0</u>
Total Contribution	9.36%	\$4	7.59%	\$4
Rate Group #12 – Plans G, H, future service, and U Combined				
Normal Cost	13.85%	\$155	13.14%	\$147
UAAL ^{(3),(4)}	<u>0.00%</u>	<u>0</u>	<u>0.00%</u> ⁽⁵⁾	<u>0</u>
Total Contribution	13.85%	\$155	13.14%	\$147

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation

⁽⁴⁾ UAAL rate has been adjusted to reflect future service only benefit improvement under 2.7% @ 55.

⁽⁵⁾ These rates are after adjustment to the contribution rates for the FY 18-19 for additional UAAL contributions made during calendar year 2017.

⁽⁶⁾ Applicable for members hired on or after January 1, 2013.

⁽⁷⁾ There is only one member in Plan U. The increase in the employer Normal Cost rate from last year to this year is primarily due to changes in actuarial assumption. There is also impact due to calculation of Normal Cost in nearest \$1000.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

Safety Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	<u>Rate</u> ⁽¹⁾	<u>Estimated Annual Amount</u> ⁽²⁾	<u>Rate</u>	<u>Estimated Annual Amount</u> ⁽²⁾
Rate Group #6 – Plans E and F (3% @ 50 – Probation)				
Normal Cost	23.71%	\$14,915	21.87%	\$13,758
UAAL ⁽³⁾	<u>28.74%</u>	<u>18,079</u>	<u>26.06%</u>	<u>16,394</u>
Total Contribution	52.45%	\$32,994	47.93%	\$30,152
Rate Group #6 – Plan V (2.7% @ 57 PEPRV)⁽⁴⁾				
Normal Cost	16.63%	\$192	15.24%	\$176
UAAL ⁽³⁾	<u>28.74%</u>	<u>332</u>	<u>26.06%</u>	<u>301</u>
Total Contribution	45.37%	\$524	41.30%	\$477
Rate Group #6 – Plans E, F and V Combined				
Normal Cost	23.58%	\$15,107	21.75%	\$13,934
UAAL ⁽³⁾	<u>28.74%</u>	<u>18,411</u>	<u>26.06%</u>	<u>16,695</u>
Total Contribution	52.32%	\$33,518	47.81%	\$30,629

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation

⁽⁴⁾ Applicable for members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

Safety Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	<u>Rate⁽¹⁾</u>	<u>Estimated Annual Amount⁽²⁾</u>	<u>Rate</u>	<u>Estimated Annual Amount⁽²⁾</u>
Rate Group #7 – Plans E and F (3% @ 50 – Law Enforcement)				
Normal Cost	26.69%	\$42,227	25.63%	\$40,550
UAAL ⁽³⁾	<u>37.36%</u>	<u>59,108</u>	<u>38.19%</u>	<u>60,421</u>
Total Contribution	64.05%	\$101,335	63.82%	\$100,971
Rate Group #7 – Plans Q and R (3% @ 55 – Law Enforcement)				
Normal Cost	23.69%	\$9,835	23.00%	\$9,548
UAAL ⁽³⁾	<u>37.36%</u>	<u>15,510</u>	<u>38.19%</u>	<u>15,855</u>
Total Contribution	61.05%	\$25,345	61.19%	\$25,403
Rate Group #7 – Plan V (2.7% @ 57 PEPRA)⁽⁴⁾				
Normal Cost	19.29%	\$7,069	19.39%	\$7,106
UAAL ⁽³⁾	<u>37.36%</u>	<u>13,691</u>	<u>38.19%</u>	<u>13,995</u>
Total Contribution	56.65%	\$20,760	57.58%	\$21,101
Rate Group #7 – Plans E, F, Q, R and V Combined				
Normal Cost	25.02%	\$59,131	24.20%	\$57,204
UAAL ⁽³⁾	<u>37.36%</u>	<u>88,309</u>	<u>38.19%</u>	<u>90,271</u>
Total Contribution	62.38%	\$147,440	62.39%	\$147,475

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation

⁽⁴⁾ Applicable for members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

Safety Employers	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Group #8 – Plans E and F (3% @ 50 – OCFA)				
Normal Cost	27.24%	\$27,663	26.84%	\$27,257
UAAL ⁽³⁾	<u>20.80%</u>	<u>21,123</u>	<u>22.27%</u>	<u>22,616</u>
Total Contribution	48.04%	\$48,786	49.11%	\$49,873
Rate Group #8 – Plans Q and R (3% @ 55 – OCFA)				
Normal Cost	21.97%	\$2,116	21.86%	\$2,106
UAAL ⁽³⁾	<u>20.80%</u>	<u>2,004</u>	<u>22.27%</u>	<u>2,145</u>
Total Contribution	42.77%	\$4,120	44.13%	\$4,251
Rate Group #8 – Plan V (2.7% @ 57 PEPRA)⁽⁴⁾				
Normal Cost	15.44%	\$2,301	14.84%	\$2,211
UAAL ⁽³⁾	<u>20.80%</u>	<u>3,100</u>	<u>22.27%</u>	<u>3,319</u>
Total Contribution	36.24%	\$5,401	37.11%	\$5,530
Rate Group #8 – Plans E, F, Q, R and V Combined				
Normal Cost	25.44%	\$32,080	25.04%	\$31,574
UAAL ⁽³⁾	<u>20.80%</u>	<u>26,227</u>	<u>22.27%</u>	<u>28,080</u>
Total Contribution	46.24%	\$58,307	47.31%	\$59,654

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ See page 28 for projected annual compensation.

⁽³⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation

⁽⁴⁾ Applicable for members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General and Safety Combined	December 31, 2017 Valuation		December 31, 2016 Valuation	
	Rate ⁽¹⁾	Estimated Annual Amount ⁽²⁾	Rate	Estimated Annual Amount ⁽²⁾
Rate Groups #1 – #12				
Total Contribution	37.97%	\$687,995	36.43%	\$660,105

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ Based on December 31, 2017 projected annual compensation (also in thousands):

General Employers		Safety Employers	
Rate Group #1 – Plans A and B	\$47,054	Rate Group #6 – Plans E and F	62,907
Rate Group #1 – Plan U	36,621	Rate Group #6 – Plan V	1,155
Rate Group #2 – Plans I and J		Rate Group #7 – Plans E and F	158,212
non-Children and Families Commission	832,783	Rate Group #7 – Plans Q and R	41,515
Rate Group #2 – Plans I and J		Rate Group #7 – Plan V	36,646
Children and Families Commission	519	Rate Group #8 – Plans E and F	101,553
Rate Group #2 – Plans O and P	14,914	Rate Group #8 – Plans Q and R	9,633
Rate Group #2 – Plan S	2,039	Rate Group #8 – Plan V	14,902
Rate Group #2 – Plan T	224,607		
Rate Group #2 – Plan U			
non-Children and Families Commission	17,570		
Rate Group #2 – Plan U			
Children and Families Commission	466		
Rate Group #2 – Plan W	146		
Rate Group #3 – Plans G and H	47,462		
Rate Group #3 – Plan B	6,212		
Rate Group #3 – Plan U	15,465		
Rate Group #5 – Plans A and B	92,282		
Rate Group #5 – Plan U	10,449		
Rate Group #9 – Plans M and N	4,210		
Rate Group #9 – Plan U	3,107		
Rate Group #10 – Plans I and J	14,828		
Rate Group #10 – Plans M and N	3,651		
Rate Group #10 – Plan U	8,213		
Rate Group #11 – Plans M and N	1,292		
Rate Group #11 – Plan U	345		
Rate Group #12 – Plans G and H	1,071		
Rate Group #12 – Plan U	48		
		Total General and Safety Combined	\$1,811,877

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 13 (Continued)

Recommended Employer Contribution Rates as of December 31, 2017 (Dollar Amounts in Thousands)

General Employers –Local Agency Formation Commission and Orange County Employees Retirement System

	December 31, 2017 Valuation		December 31, 2016 Valuation	
	<u>Rate</u> ^{(1),(2)}	<u>Rate</u> ^{(1),(3)}	<u>Rate</u> ⁽²⁾	<u>Rate</u> ⁽³⁾
Rate Group #2 – Plans I and J (2.7% @ 55 – non-OCFA)				
Normal Cost	14.39%	14.39%	13.19%	13.19%
UAAL ⁽⁴⁾	<u>21.06%</u>	<u>22.67%</u>	<u>19.61%</u>	<u>21.72%</u>
Total Contribution	35.45%	37.06%	32.80%	34.91%
Rate Group #2 – Plans O and P (1.62% @ 65)⁽⁵⁾				
Normal Cost	6.21%	6.21%	5.53%	5.53%
UAAL ⁽⁴⁾	<u>21.06%</u>	<u>22.67%</u>	<u>19.61%</u>	<u>21.72%</u>
Total Contribution	27.27%	28.88%	25.14%	27.25%
Rate Group #2 – Plan T (1.62% @ 65 PEPRA)⁽⁶⁾				
Normal Cost	7.11%	7.11%	6.58%	6.58%
UAAL ⁽⁴⁾	<u>21.06%</u>	<u>22.67%</u>	<u>19.61%</u>	<u>21.72%</u>
Total Contribution	28.17%	29.78%	26.19%	28.30%
Rate Group #2 – Plan U (2.5% @ 67 PEPRA)⁽⁷⁾				
Normal Cost	8.78%	8.78%	8.28%	8.28%
UAAL ⁽⁴⁾	<u>21.06%</u>	<u>22.67%</u>	<u>19.61%</u>	<u>21.72%</u>
Total Contribution	29.84%	31.45%	27.89%	30.00%

⁽¹⁾ These rates reflect only 1/3 of UAAL cost impact due to assumptions changes.

⁽²⁾ These rates are after reflecting future service only benefit improvements under 2.7% @ 55.

⁽³⁾ These rates are before reflecting future service only benefit improvements under 2.7% @ 55.

⁽⁴⁾ UAAL rate has been adjusted to reflect 18-month delay between date of valuation and date of rate implementation.

⁽⁵⁾ Applicable for Local Agency Formation Commission members hired on or after July 1, 2010 but before January 1, 2013.

⁽⁶⁾ Applicable for Local Agency Formation Commission members hired on or after January 1, 2013.

⁽⁷⁾ Applicable for Orange County Employees Retirement System members hired on or after January 1, 2013.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 14

“Pick – Up” - Discount Percentages for Non-PEPRA Tier Members

For every dollar of member contribution “picked up” by the employer for non-PEPRA tier members and not deposited in the member’s contribution account, the employer can contribute less than a dollar. This is because the “pick-up” amount is not deposited in the member’s contribution account and so is not payable to a member who withdraws his or her contributions following termination of employment, and is not payable as an additional death benefit. The contribution discount percentages are as follows:

	December 31, 2017 Valuation Pick-Up Percentage		December 31, 2016 Valuation Pick-Up Percentage	
<i>General Members</i>				
Rate Group #1 Plan A/B (non-OCTA, non-OCSD)	Plan A: 100.00%	Plan B: 98.16%	Plan A: 100.00%	Plan B: 97.14%
Rate Group #2 (2.7% @ 55 – non-OCFA)	Plan I: 99.37%	Plan J: 98.38%	Plan I: 99.00%	Plan J: 97.47%
Rate Group #2 (1.62% @ 65)	Plan O: Not calculated	Plan P: 97.33%	Plan O: Not calculated	Plan P: 96.46%
Rate Group #2 (2.0% @ 57)		Plan S: 97.70%		Plan S: 96.72%
Rate Group #3 (2.5% @ 55 – OCSD)	Plan G: 100.00%	Plan H: 98.53%	Plan G: 98.21%	Plan H: 97.73%
Rate Group #3 (1.64% @ 57 – OCSD)		Plan B: 97.48%		Plan B: 96.50%
Rate Group #5 Plan A/B (OCTA)	Plan A: 98.82%	Plan B: 97.46%	Plan A: 98.17%	Plan B: 94.74%
Rate Group #9 (2.0% @ 55 – TCA)	Plan M: Not calculated	Plan N: 98.34%	Plan M: Not calculated	Plan N: 97.64%
Rate Group #10 (2.7% @ 55 – OCFA)	Plan I: Not calculated	Plan J: 98.53%	Plan I: Not calculated	Plan J: 97.72%
Rate Group #10 (2.0% @ 55 – OCFA)	Plan M: Not calculated	Plan N: 97.57%	Plan M: Not calculated	Plan N: 96.41%
Rate Group #11 (2.0% @ 55 – Cemetery)	Plan M: Not calculated	Plan N: 98.52%	Plan M: Not calculated	Plan N: 97.64%
Rate Group #12 (2.5% @ 55 – Law Library)	Plan G: Not calculated	Plan H: 98.82%	Plan G: Not calculated	Plan H: 98.04%

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 14 (Continued)

“Pick – Up” - Discount Percentages

	December 31, 2017 Valuation Pick-Up Percentage		December 31, 2016 Valuation Pick-Up Percentage	
<i>Safety Members</i>				
Rate Group #6 (3% @ 50 – Probation)	Plan E: 100.00%	Plan F: 99.43%	Plan E: 100.00%	Plan F: 98.74%
Rate Group #7 (3% @ 50 – Law Enforcement)	Plan E: 100.00%	Plan F: 99.69%	Plan E: 100.00%	Plan F: 99.60%
Rate Group #7 (3% @ 55 – Law Enforcement)	Plan Q: Not calculated	Plan R: 99.37%	Plan Q: Not calculated	Plan R: 99.23%
Rate Group #8 (3% @ 50 – OCFA)	Plan E: 100.00%	Plan F: 99.61%	Plan E: 100.00%	Plan F: 99.51%
Rate Group #8 (3% @ 55 – OCFA)	Plan Q: Not calculated	Plan R: 99.38%	Plan Q: Not calculated	Plan R: 99.30%

SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 14 (Continued)
“Pick – Up” - Average Entry Age

The following table provides the average entry age by employer used in determining the “pick-up” contributions under Section 31581.1.

<u>Employer</u>	<u>Code</u>	<u>Average Entry Age for All non-PEPRA Members</u>
General		
Orange County	101	32
Cemetery District	102	30
Law Library	103	40
Retirement System	105	32
OCFA	106	33
Transportation Corridor Agency	109	38
City of San Juan Capistrano	110	33
Sanitation District	111	34
OCTA	112	36
Children & Families Commission	118	27
Local Agency Formation Commission	119	38
Superior Court	121	32
IHSS Public Authority	122	39
Safety		
Probation	101	27
Law Enforcement	101	27
OCFA	106	30

Note: In preparing the average entry age, we only included the non-PEPRA members starting with this valuation. (Previously, we had included both non-PEPRA and PEPRA members in preparing the average entry age.)

SECTION 2: Valuation Results for the Orange County Employees Retirement System

The contribution rates as of December 31, 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 or methods.

Reconciliation of Recommended Contribution

The chart below details the changes in the recommended contribution from the prior valuation to the current year's valuation, for the entire Retirement System. A reconciliation of the recommended contribution from the prior valuation to the current year's valuation by Rate Group is provided in Appendix D.

CHART 15

Reconciliation of Recommended Employer Contribution Rate from December 31, 2016 to December 31, 2017 (Dollar Amounts in Thousands)

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

	Contribution Rate	Estimated Amount ⁽¹⁾
1. Aggregate Recommended Contribution Rate as of December 31, 2016 (before adjustments to FY 18/19 rates)	36.45%	\$660,428
2. Adjustment to FY18-19 rates for additional UAAL contributions from Children and Families Commission and Law Library	(0.02%)	(323)
3. Aggregate Recommended Contribution Rate as of December 31, 2016 (after adjustments to FY 18/19 rates)	36.43%	\$660,105
4. Actuarial (gain)/loss items:		
(a) Effect of investment gain (after smoothing)	(0.10%)	\$(1,812)
(b) Effect of additional UAAL contributions from OCFA and anticipated payments from DOE and U.C.I.	(0.14%)	(2,536)
(c) Effect of actual contributions less than expected	0.15%	2,718
(d) Effect of lower than expected COLA increases	(0.38%)	(6,885)
(e) Effect of lower than expected salary increases	(0.26%)	(4,711)
(f) Effect of growth in total payroll greater than expected	(0.01%)	(181)
(g) Effect of other experience (gain)/loss ⁽²⁾	(0.06%)	(1,050)
(h) Effect of changes in actuarial assumptions ^{(3),(4)}	4.81%	87,151
(i) Effect of three-year phase-in of UAAL cost impact due to changes in actuarial assumptions	<u>(2.47%)</u>	<u>(44,804)</u>
(j) Subtotal	1.54%	\$27,890
5. Aggregate Recommended Contribution Rate as of December 31, 2017	37.97%	\$687,995

⁽¹⁾ Based on December 31, 2017 projected annual compensation of \$1,811,877,000.

⁽²⁾ Net of an adjustment of 0.35% to reflect 18-month delay between date of valuation and date of rate implementation for the rate impact of all actuarial experience.

⁽³⁾ Include the effect of \$24,042,000 asset transfer from O.C. Sanitation District UAAL Deferred Account to valuation assets.

⁽⁴⁾ Normal Cost increased by 1.10% and UAAL cost increased by 3.71%.

SECTION 2: Valuation Results for the Orange County Employees Retirement System

The member contribution rates as of December 31, 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, and changes in the actuarial assumptions or methods.

Reconciliation of Recommended Contribution Rate
 The chart below details the changes in the aggregate recommended member contribution rate from the prior valuation to the current year’s valuation.

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

CHART 16
Reconciliation of Average Recommended Member Contribution from December 31, 2016 to December 31, 2017 (Dollar Amounts in Thousands)

	Contribution Rate	Estimated Amount ⁽¹⁾
Average Recommended Contribution Rate as of December 31, 2016 ⁽²⁾	11.97%	\$216,914
Effect of changes in demographics	(0.11%)	\$(1,977)
Effect of changes in actuarial assumptions	<u>0.77%</u>	<u>13,951</u>
Subtotal	0.66%	\$11,974
Average Recommended Contribution Rate as of December 31, 2017	12.63%	\$228,888

⁽¹⁾ Based on December 31, 2017 projected annual compensation of \$1,811,877,000.

⁽²⁾ Rates have been recalculated by applying the individual entry age based rates determined in the December 31, 2016 valuation to the System membership as of December 31, 2017.

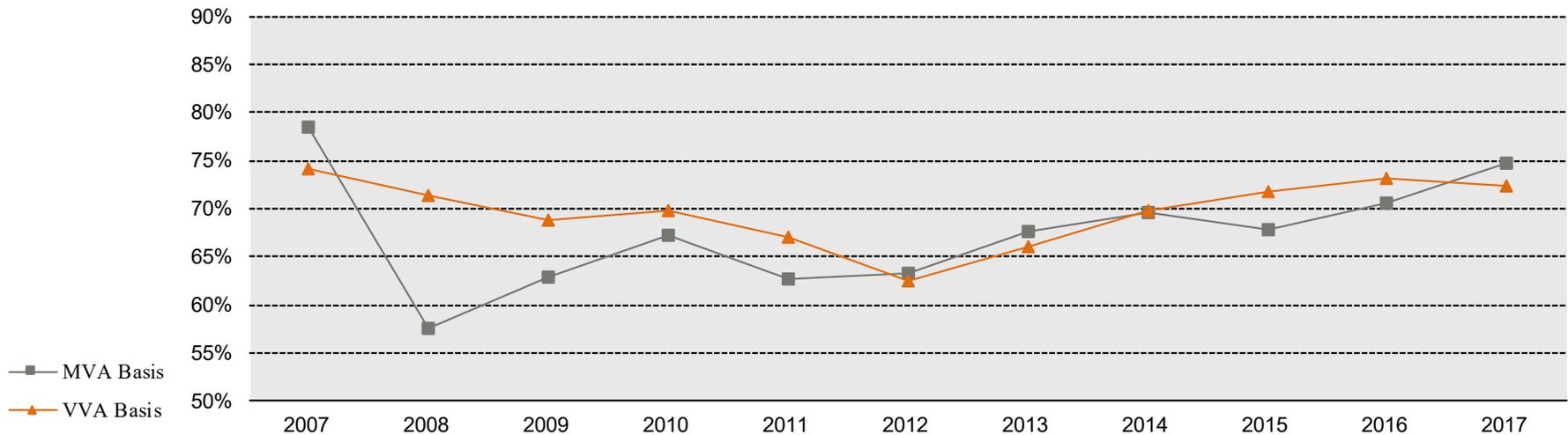
SECTION 2: Valuation Results for the Orange County Employees Retirement System

E. FUNDED RATIO

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

performance, or a variety of other factors. The chart below depicts a history of the funded ratio for this plan.

CHART 17
Funded Ratio for Plan Years Ending December 31, 2007 - 2017



SECTION 2: Valuation Results for the Orange County Employees Retirement System

CHART 18
Schedule of Funding Progress

Actuarial Valuation Date December 31	Valuation Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Projected Covered Payroll (c)	UAAL as a Percentage of Projected Covered Payroll [(b) - (a)] / (c)
2008	\$7,748,380,000	\$10,860,715,000	\$3,112,335,000	71.34%	\$1,569,764,000	198.27%
2009	8,154,687,000	11,858,578,000	3,703,891,000	68.77%	1,618,491,000	228.85%
2010	8,672,592,000	12,425,873,000	3,753,281,000	69.79%	1,579,239,000	237.66%
2011	9,064,355,000	13,522,978,000	4,458,623,000	67.03%	1,619,474,000	275.31%
2012	9,469,208,000	15,144,888,000	5,675,680,000	62.52%	1,609,600,000	352.55%
2013	10,417,125,000	15,785,042,000	5,367,917,000	65.99%	1,604,496,000	334.55%
2014	11,449,911,000	16,413,124,000	4,963,213,000	69.76%	1,648,160,000	301.14%
2015	12,228,009,000	17,050,357,000	4,822,348,000	71.72%	1,633,112,000	295.29%
2016	13,102,978,000	17,933,461,000	4,830,483,000	73.06%	1,759,831,000	274.49%
2017	14,197,125,000	19,635,427,000	5,438,302,000	72.30%	1,811,877,000	300.15%

For informational purposes only, we have also developed the funded ratio determined using the historical market value of assets after adjustment for amounts in the County Investment Account (funded by pension obligation bond proceeds held by OCERS), prepaid employer contributions, O.C. Sanitation District UAAL Deferred Account (after transfer), unclaimed member reserve and Medicare Medical Insurance Reserve.

Actuarial Valuation Date December 31	Funded Ratio Based on Net Market Value of Assets	Actuarial Valuation Date December 31	Funded Ratio Based on Net Market Value of Assets
2008	57.51%	2013	67.65%
2009	62.94%	2014	69.63%
2010	67.25%	2015	67.73%
2011	62.60%	2016	70.58%
2012	63.17%	2017	74.62%

SECTION 2: Valuation Results for the Orange County Employees 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 OCERS, the current AVR is about 8.1. This means that a 1% asset gain/(loss) (relative to the assumed investment return) translates to about 8.1% of one-year’s payroll. Since OCERS amortizes actuarial gains and losses over a 20-year period, there would be a 0.6% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

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

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

For OCERS, the current LVR is about 10.8. This is about 33% higher than the AVR. Therefore, we would expect that contribution volatility will increase over the long-term.

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

CHART 19
Volatility Ratios for Years Ended December 31, 2009 - 2017

Year Ended December 31	Asset Volatility Ratios			Liability Volatility Ratios		
	General	Safety	Total	General	Safety	Total
2009	4.2	6.1	4.6	6.6	10.0	7.3
2010	4.7	7.3	5.3	7.0	10.9	7.9
2011	4.7	7.1	5.2	7.6	10.9	8.4
2012	5.3	8.1	5.9	8.6	12.3	9.4
2013	6.0	8.9	6.7	9.0	12.6	9.8
2014	6.2	9.4	6.9	8.9	13.6	10.0
2015	6.3	9.6	7.1	9.3	14.3	10.4
2016	6.4	9.9	7.2	9.0	14.2	10.2
2017	7.2	11.0	8.1	9.6	14.8	10.8

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

i. Rate Group #1 – General – Plans A, B and U (non-OCTA, non-OCSD)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	1,555	1,640	-5.2%
Average age	43.1	42.0	1.1
Average service	9.8	8.9	0.9
Projected total compensation	\$83,675,611	\$83,218,758	0.5%
Projected average compensation	\$53,811	\$50,743	6.0%
Account balances	\$55,414,963	\$49,693,494	11.5%
Total active vested members	817	795	2.8%
Vested terminated members⁽¹⁾			
Number	496	445	11.5%
Average age	41.6	41.7	-0.1
Retired members			
Number in pay status	627	617	1.6%
Average age	74.9	74.4	0.5
Average monthly benefit ⁽²⁾	\$2,645	\$2,626	0.7%
Disabled members			
Number in pay status	37	38	-2.6%
Average age	67.6	67.2	0.4
Average monthly benefit ⁽²⁾	\$2,337	\$2,290	2.1%
Beneficiaries			
Number in pay status	96	93	3.2%
Average age	76.7	76.3	0.4
Average monthly benefit ⁽²⁾	\$1,360	\$1,324	2.7%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

ii. Rate Group #2 – General – Plans I, J, O, P, S, T, U and W

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	14,097	14,075	0.2%
Average age	45.7	45.9	-0.2
Average service	12.9	13.0	-0.1
Projected total compensation	\$1,093,044,342	\$1,064,427,772	2.7%
Projected average compensation	\$77,537	\$75,625	2.5%
Account balances	\$1,930,686,878	\$1,833,455,161	5.3%
Total active vested members	10,337	10,700	-3.4%
Vested terminated members⁽¹⁾			
Number	3,928	3,629	8.2%
Average age	44.9	44.8	0.1
Retired members			
Number in pay status	9,067	8,772	3.4%
Average age	70.9	70.8	0.1
Average monthly benefit ⁽²⁾	\$3,628	\$3,513	3.3%
Disabled members			
Number in pay status	582	569	2.3%
Average age	66.8	66.7	0.1
Average monthly benefit ⁽²⁾	\$2,477	\$2,438	1.6%
Beneficiaries			
Number in pay status	1,433	1,397	2.6%
Average age	75.0	75.2	-0.2
Average monthly benefit ⁽²⁾	\$1,829	\$1,765	3.6%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

iii. Rate Group #3 – General – Plans B, G, H and U (OCSD)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	592	578	2.4%
Average age	48.0	48.0	0.0
Average service	12.7	13.2	-0.5
Projected total compensation	\$69,138,987	\$65,370,761	5.8%
Projected average compensation	\$116,789	\$113,098	3.3%
Account balances	\$89,050,369	\$87,379,694	1.9%
Total active vested members	438	440	-0.5%
Vested terminated members⁽¹⁾			
Number	112	104	7.7%
Average age	46.8	47.6	-0.8
Retired members			
Number in pay status	372	355	4.8%
Average age	67.8	67.6	0.2
Average monthly benefit ⁽²⁾	\$5,321	\$5,075	4.8%
Disabled members			
Number in pay status	15	13	15.4%
Average age	66.6	66.4	0.2
Average monthly benefit ⁽²⁾	\$3,633	\$3,259	11.5%
Beneficiaries			
Number in pay status	72	71	1.4%
Average age	69.3	70.3	-1.0
Average monthly benefit ⁽²⁾	\$2,282	\$2,154	5.9%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

iv. Rate Group #5 – General – Plans A, B and U (OCTA)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	1,313	1,372	-4.3%
Average age	50.4	50.0	0.4
Average service	13.8	13.3	0.5
Projected total compensation	\$102,731,350	\$104,111,593	-1.3%
Projected average compensation	\$78,242	\$75,883	3.1%
Account balances	\$128,751,586	\$124,925,999	3.1%
Total active vested members	1,021	1,045	-2.3%
Vested terminated members⁽¹⁾			
Number	584	568	2.8%
Average age	49.6	49.6	0.0
Retired members			
Number in pay status	903	863	4.6%
Average age	69.8	69.5	0.3
Average monthly benefit ⁽²⁾	\$2,463	\$2,402	2.5%
Disabled members			
Number in pay status	258	256	0.8%
Average age	65.9	65.4	0.5
Average monthly benefit ⁽²⁾	\$2,304	\$2,254	2.2%
Beneficiaries			
Number in pay status	167	166	0.6%
Average age	71.2	71.5	-0.3
Average monthly benefit ⁽²⁾	\$1,349	\$1,294	4.3%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

v. Rate Group #9 – General – Plans M, N and U (TCA)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	64	68	-5.9%
Average age	49.2	49.3	-0.1
Average service	8.4	10.0	-1.6
Projected total compensation	\$7,317,008	\$6,835,138	7.0%
Projected average compensation	\$114,328	\$100,517	13.7%
Account balances	\$5,438,441	\$5,835,926	-6.8%
Total active vested members	34	45	-24.4%
Vested terminated members⁽¹⁾			
Number	61	56	8.9%
Average age	44.5	45.1	-0.6
Retired members			
Number in pay status	44	40	10.0%
Average age	68.6	68.5	0.1
Average monthly benefit ⁽²⁾	\$2,944	\$2,768	6.4%
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽²⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	4	3	33.3%
Average age	70.0	72.1	-2.1
Average monthly benefit ⁽²⁾	\$451	\$427	5.6%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

vi. Rate Group #10 – General – Plans I, J, M, N and U (OCFA)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	281	302	-7.0%
Average age	45.5	44.1	1.4
Average service ⁽¹⁾	10.8	10.0	0.8
Projected total compensation	\$26,691,539	\$26,836,736	-0.5%
Projected average compensation	\$94,988	\$88,863	6.9%
Account balances	\$27,364,974	\$26,401,200	3.7%
Total active vested members	176	176	0.0%
Vested terminated members⁽²⁾			
Number	154	131	17.6%
Average age	41.9	42.6	-0.7
Retired members			
Number in pay status	157	141	11.3%
Average age	65.3	65.4	-0.1
Average monthly benefit ⁽³⁾	\$4,424	\$4,446	-0.5%
Disabled members			
Number in pay status	10	10	0.0%
Average age	61.4	60.4	1.0
Average monthly benefit ⁽³⁾	\$2,522	\$2,473	2.0%
Beneficiaries			
Number in pay status	12	10	20.0%
Average age	64.7	62.2	2.5
Average monthly benefit ⁽³⁾	\$1,273	\$1,419	-10.3%

⁽¹⁾ For some former Santa Ana members, service used in calculating the average above is only used for vesting purposes. Benefit service starts to accrue only effective April 2012.

⁽²⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽³⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

vii. Rate Group #11 – General – Plans M and N, future service, and U (Cemetery)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	25	22	13.6%
Average age	49.3	48.1	1.2
Average service	15.7	16.8	-1.1
Projected total compensation	\$1,637,025	\$1,397,215	17.2%
Projected average compensation	\$65,481	\$63,510	3.1%
Account balances	\$2,227,789	\$1,994,990	11.7%
Total active vested members	18	18	0.0%
Vested terminated members⁽¹⁾			
Number	2	3	-33.3%
Average age	39.1	37.2	1.9
Retired members			
Number in pay status	5	5	0.0%
Average age	75.8	74.8	1.0
Average monthly benefit ⁽²⁾	\$2,455	\$2,406	2.0%
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽²⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	4	4	0.0%
Average age	79.0	78.0	1.0
Average monthly benefit ⁽²⁾	\$1,598	\$1,567	2.0%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

viii. Rate Group #12 – General – Plans G, H, future service, and U (Law Library)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	14	15	-6.7%
Average age	57.5	57.1	0.4
Average service	17.5	16.5	1.0
Projected total compensation	\$1,119,773	\$1,164,792	-3.9%
Projected average compensation	\$79,984	\$77,653	3.0%
Account balances	\$2,634,092	\$2,505,275	5.1%
Total active vested members	13	14	-7.1%
Vested terminated members⁽¹⁾			
Number	4	4	0.0%
Average age	48.6	47.6	1.0
Retired members			
Number in pay status	11	10	10.0%
Average age	71.8	71.3	0.5
Average monthly benefit ⁽²⁾	\$2,200	\$2,165	1.6%
Disabled members			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽²⁾	N/A	N/A	N/A
Beneficiaries			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit ⁽²⁾	N/A	N/A	N/A

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

ix. Rate Group #6 – Safety – Plans E, F and V (Probation)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	763	806	-5.3%
Average age	44.6	43.8	0.8
Average service	17.1	16.2	0.9
Projected total compensation	\$64,062,602	\$65,135,279	-1.6%
Projected average compensation	\$83,961	\$80,813	3.9%
Account balances	\$137,781,996	\$129,680,498	6.2%
Total active vested members	743	760	-2.2%
Vested terminated members⁽¹⁾			
Number	220	211	4.3%
Average age	41.1	40.3	0.8
Retired members			
Number in pay status	306	283	8.1%
Average age	65.9	65.9	0.0
Average monthly benefit ⁽²⁾	\$5,444	\$5,429	0.3%
Disabled members			
Number in pay status	29	28	3.6%
Average age	54.8	54.0	0.8
Average monthly benefit ⁽²⁾	\$2,872	\$2,821	1.8%
Beneficiaries			
Number in pay status	25	26	-3.8%
Average age	64.6	61.9	2.7
Average monthly benefit ⁽²⁾	\$2,473	\$2,387	3.6%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

x. Rate Group #7 – Safety – Plans E, F, Q, R and V (Law Enforcement)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	2,010	1,907	5.4%
Average age	41.0	41.7	-0.7
Average service	13.4	14.1	-0.7
Projected total compensation	\$236,373,080	\$219,505,701	7.7%
Projected average compensation	\$117,599	\$115,105	2.2%
Account balances	\$298,704,270	\$270,051,750	10.6%
Total active vested members	1,607	1,502	7.0%
Vested terminated members⁽¹⁾			
Number	175	170	2.9%
Average age	43.4	42.6	0.8
Retired members			
Number in pay status	1,333	1,283	3.9%
Average age	63.9	63.7	0.2
Average monthly benefit ⁽²⁾	\$6,876	\$6,756	1.8%
Disabled members			
Number in pay status	351	350	0.3%
Average age	63.2	62.9	0.3
Average monthly benefit ⁽²⁾	\$4,977	\$4,817	3.3%
Beneficiaries			
Number in pay status	351	320	9.7%
Average age	67.3	66.9	0.4
Average monthly benefit ⁽²⁾	\$3,011	\$2,886	4.3%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

xi. Rate Group #8 – Safety – Plans E, F, Q, R and V (OCFA)

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	1,007	961	4.8%
Average age	43.3	44.1	-0.8
Average service ⁽¹⁾	13.9	14.3	-0.4
Projected total compensation	\$126,088,193	\$121,829,553	3.5%
Projected average compensation	\$125,212	\$126,774	-1.2%
Account balances	\$137,783,839	\$122,675,043	12.3%
Total active vested members	836	732	14.2%
Vested terminated members⁽²⁾			
Number	67	49	36.7%
Average age	43.1	40.0	3.1
Retired members			
Number in pay status	414	397	4.3%
Average age	64.5	63.9	0.6
Average monthly benefit ⁽³⁾	\$7,976	\$7,788	2.4%
Disabled members			
Number in pay status	164	155	5.8%
Average age	65.2	64.6	0.6
Average monthly benefit ⁽³⁾	\$6,628	\$6,602	0.4%
Beneficiaries			
Number in pay status	97	93	4.3%
Average age	62.8	61.7	1.1
Average monthly benefit ⁽³⁾	\$3,206	\$3,025	6.0%

⁽¹⁾ For some former Santa Ana members, service used in calculating the average above is only used for vesting purposes. Benefit service starts to accrue only effective April 2012.

⁽²⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽³⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT A

Table of Plan Coverage

xii. Total

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Active members in valuation			
Number	21,721	21,746	-0.1%
Average age	45.3	45.4	-0.1
Average service	12.9	12.9	0.0
Projected total compensation	\$1,811,879,510	\$1,759,833,297	3.0%
Projected average compensation	\$83,416	\$80,927	3.1%
Account balances	\$2,815,839,196	\$2,654,599,030	6.1%
Total active vested members	16,040	16,227	-1.2%
Vested terminated members⁽¹⁾			
Number	5,803	5,370	8.1%
Average age	44.8	44.8	0.0
Retired members			
Number in pay status	13,240	12,767	3.7%
Average age	69.8	69.7	0.1
Average monthly benefit ⁽²⁾	\$4,060	\$3,946	2.9%
Disabled members			
Number in pay status	1,446	1,419	1.9%
Average age	65.3	65.0	0.3
Average monthly benefit ⁽²⁾	\$3,540	\$3,458	2.4%
Beneficiaries			
Number in pay status	2,261	2,183	3.6%
Average age	72.8	72.8	0.0
Average monthly benefit ⁽²⁾	\$2,032	\$1,945	4.5%

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes monthly benefits payable from the STAR COLA.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

i. Rate Group #1 – General – Plans A, B and U (non-OCTA, non-OCSD)

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	37	37	--	--	--	--	--	--	--	--
	\$60,096	\$60,096	--	--	--	--	--	--	--	--
25-29	216	213	3	--	--	--	--	--	--	--
	51,228	51,215	\$52,181	--	--	--	--	--	--	--
30-34	233	178	29	26	--	--	--	--	--	--
	51,560	49,967	56,798	\$56,625	--	--	--	--	--	--
35-39	220	104	35	52	29	--	--	--	--	--
	53,607	49,915	56,727	57,100	\$56,817	--	--	--	--	--
40-44	197	59	12	61	55	9	1	--	--	--
	54,815	49,138	57,469	57,597	57,058	\$55,702	\$56,812	--	--	--
45-49	198	49	15	56	43	20	15	--	--	--
	55,287	49,064	57,237	57,357	56,510	58,883	57,638	--	--	--
50-54	138	39	13	28	24	9	22	3	--	--
	54,395	47,557	56,264	56,112	56,753	57,956	58,942	\$56,260	--	--
55-59	133	35	16	20	20	8	30	4	--	--
	54,289	47,931	55,001	56,703	55,829	55,961	57,824	57,429	--	--
60-64	120	26	6	14	12	14	41	2	5	--
	55,305	49,600	55,207	56,802	56,487	56,513	57,445	57,821	\$56,140	--
65-69	42	6	2	7	11	1	13	1	1	--
	54,699	45,650	55,421	55,659	55,018	62,214	57,359	53,405	56,503	--
70 & over	21	1	1	3	3	4	9	--	--	--
	55,880	47,775	53,353	56,320	54,306	55,272	57,710	--	--	--
Total	1,555	747	132	267	197	65	131	10	6	--
	\$53,811	\$50,421	\$56,396	\$57,026	\$56,550	\$57,273	\$57,810	\$56,754	\$56,200	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

ii. Rate Group #2 – General – Plans I, J, O, P, S, T, U and W

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	213	213	--	--	--	--	--	--	--	--
	\$49,359	\$49,359	--	--	--	--	--	--	--	--
25-29	993	932	53	8	--	--	--	--	--	--
	56,867	56,352	\$64,611	\$65,539	--	--	--	--	--	--
30-34	1,609	966	324	313	6	--	--	--	--	--
	66,464	64,975	72,962	64,208	\$72,977	--	--	--	--	--
35-39	1,892	576	373	726	213	4	--	--	--	--
	75,846	71,411	81,958	77,728	70,874	\$67,671	--	--	--	--
40-44	2,011	434	228	618	612	117	2	--	--	--
	79,278	72,034	81,707	81,198	81,280	81,121	\$60,221	--	--	--
45-49	2,160	265	198	498	643	348	207	1	--	--
	84,862	75,719	87,685	85,260	87,127	87,266	81,914	\$68,620	--	--
50-54	2,076	228	154	353	488	318	434	95	6	--
	84,780	80,338	82,121	82,031	83,734	91,752	86,979	80,787	\$103,239	--
55-59	1,600	156	117	282	342	217	320	128	36	2
	83,837	84,705	86,508	84,589	79,724	83,189	87,540	83,202	78,102	\$78,287
60-64	960	92	60	164	256	143	139	73	28	5
	79,852	83,180	81,352	72,120	79,470	81,362	84,572	83,161	76,396	70,491
65-69	411	32	35	75	120	58	58	22	8	3
	82,121	95,709	95,872	79,667	77,815	82,921	84,197	70,187	65,848	85,666
70 & over	172	7	9	30	59	25	21	11	5	5
	71,743	47,718	58,912	84,316	74,223	71,584	58,711	80,697	56,157	75,184
Total	14,097	3,901	1,551	3,067	2,739	1,230	1,181	330	83	15
	\$77,537	\$66,865	\$80,696	\$79,177	\$81,595	\$85,848	\$85,275	\$81,502	\$76,840	\$76,130

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

iii. Rate Group #3 – General – Plans B, G, H and U (OCSD)

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	1	1	--	--	--	--	--	--	--	--
	\$69,418	\$69,418	--	--	--	--	--	--	--	--
25-29	23	19	4	--	--	--	--	--	--	--
	82,087	80,192	\$91,089	--	--	--	--	--	--	--
30-34	48	33	11	4	--	--	--	--	--	--
	98,210	91,913	112,833	\$109,952	--	--	--	--	--	--
35-39	80	35	20	24	1	--	--	--	--	--
	105,380	97,592	109,319	113,910	\$94,412	--	--	--	--	--
40-44	74	27	18	23	6	--	--	--	--	--
	111,406	105,522	117,735	113,635	110,354	--	--	--	--	--
45-49	92	20	13	20	17	9	13	--	--	--
	120,999	110,284	125,034	118,230	126,181	\$136,234	\$120,386	--	--	--
50-54	112	15	15	20	11	17	31	3	--	--
	128,229	98,854	120,395	130,528	115,162	156,074	134,733	\$121,864	--	--
55-59	84	12	20	15	8	11	17	1	--	--
	124,527	105,869	112,459	113,310	149,274	146,878	134,918	137,564	--	--
60-64	56	8	6	10	10	10	10	2	--	--
	130,170	113,133	125,940	125,059	130,343	151,065	124,670	158,733	--	--
65-69	15	3	1	2	2	1	4	1	1	--
	119,675	117,218	113,696	102,920	196,844	94,157	113,616	78,227	\$103,404	--
70 & over	7	--	1	--	1	2	2	1	--	--
	107,789	--	78,874	--	93,547	131,768	108,024	102,516	--	--
Total	592	173	109	118	56	50	77	8	1	--
	\$116,789	\$98,882	\$115,045	\$117,953	\$127,737	\$147,267	\$129,254	\$125,171	\$103,404	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

iv. Rate Group #5 – General – Plans A, B and U (OCTA)

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	15	15	--	--	--	--	--	--	--	--
	\$56,513	\$56,513	--	--	--	--	--	--	--	--
25-29	52	48	3	1	--	--	--	--	--	--
	57,103	55,763	\$74,674	\$68,726	--	--	--	--	--	--
30-34	61	39	18	4	--	--	--	--	--	--
	66,789	61,797	76,151	73,338	--	--	--	--	--	--
35-39	117	41	13	52	11	--	--	--	--	--
	77,524	69,989	88,329	77,641	\$92,288	--	--	--	--	--
40-44	138	31	22	49	34	2	--	--	--	--
	77,705	72,207	88,566	76,455	77,490	\$77,754	--	--	--	--
45-49	190	45	32	52	44	10	7	--	--	--
	78,297	65,337	93,639	81,467	75,413	81,291	\$81,780	--	--	--
50-54	231	37	18	67	61	18	24	5	1	--
	78,865	73,994	118,631	68,859	73,384	82,409	92,576	\$93,552	\$81,680	--
55-59	253	26	18	68	56	19	43	17	6	--
	83,114	69,646	107,893	78,647	78,720	106,856	83,304	85,060	76,709	--
60-64	187	15	19	34	34	17	32	19	14	3
	84,515	85,872	85,374	81,258	67,341	109,355	85,056	90,017	88,685	\$103,040
65-69	55	3	8	10	18	4	5	3	2	2
	74,782	56,948	90,425	70,718	72,576	59,130	82,055	65,570	108,512	72,339
70 & over	14	3	--	3	5	1	2	--	--	--
	71,940	88,734	--	59,867	74,289	58,617	65,643	--	--	--
Total	1,313	303	151	340	263	71	113	44	23	5
	\$78,242	\$66,852	\$93,450	\$76,450	\$75,362	\$93,468	\$85,307	\$86,837	\$86,980	\$90,760

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

v. Rate Group #9 – General – Plans M, N and U (TCA)

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25-29	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
30-34	6	5	--	1	--	--	--	--	--	--
	\$88,725	\$84,839	--	\$108,150	--	--	--	--	--	--
35-39	7	6	--	1	--	--	--	--	--	--
	83,089	88,674	--	49,579	--	--	--	--	--	--
40-44	8	3	--	4	1	--	--	--	--	--
	96,937	108,737	--	96,258	\$64,254	--	--	--	--	--
45-49	11	7	2	1	--	1	--	--	--	--
	118,992	122,839	\$151,001	56,286	--	\$90,749	--	--	--	--
50-54	14	6	1	3	3	--	1	--	--	--
	129,638	143,174	124,175	94,038	113,471	--	\$209,194	--	--	--
55-59	10	2	2	2	4	--	--	--	--	--
	121,371	95,556	85,303	159,744	133,127	--	--	--	--	--
60-64	6	2	1	1	1	1	--	--	--	--
	161,876	145,666	283,154	184,465	80,824	131,480	--	--	--	--
65-69	1	--	--	--	1	--	--	--	--	--
	76,031	--	--	--	76,031	--	--	--	--	--
70 & over	1	--	--	1	--	--	--	--	--	--
	42,691	--	--	42,691	--	--	--	--	--	--
Total	64	31	6	14	10	2	1	--	--	--
	\$114,328	\$112,381	\$146,656	\$101,986	\$109,403	\$111,114	\$209,194	--	--	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

vi. Rate Group #10 – General – Plans I, J, M, N and U (OCFA)

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	5	5	--	--	--	--	--	--	--	--
	\$52,754	\$52,754	--	--	--	--	--	--	--	--
25-29	15	15	--	--	--	--	--	--	--	--
	67,124	67,124	--	--	--	--	--	--	--	--
30-34	30	25	4	1	--	--	--	--	--	--
	77,066	76,246	\$80,064	\$85,558	--	--	--	--	--	--
35-39	39	21	7	8	3	--	--	--	--	--
	88,391	86,517	92,327	89,647	\$88,974	--	--	--	--	--
40-44	41	14	8	11	8	--	--	--	--	--
	89,913	85,414	71,008	109,485	89,781	--	--	--	--	--
45-49	45	24	4	4	9	4	--	--	--	--
	115,703	111,643	133,664	115,505	108,903	\$137,604	--	--	--	--
50-54	54	8	4	5	17	8	10	2	--	--
	99,646	108,331	109,423	116,495	88,329	104,503	\$92,969	\$113,377	--	--
55-59	31	7	5	3	8	6	2	--	--	--
	107,496	86,555	158,991	123,594	83,759	118,610	89,517	--	--	--
60-64	16	4	--	2	9	1	--	--	--	--
	104,558	98,403	--	91,314	105,732	145,105	--	--	--	--
65-69	4	--	1	1	1	1	--	--	--	--
	81,683	--	71,683	92,652	73,985	88,411	--	--	--	--
70 & over	1	--	--	1	--	--	--	--	--	--
	55,671	--	--	55,671	--	--	--	--	--	--
Total	281	123	33	36	55	20	12	2	--	--
	\$94,988	\$87,277	\$102,230	\$104,258	\$93,864	\$116,581	\$92,394	\$113,377	--	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

vii. Rate Group #11 – General – Plans M and N, future service, and U (Cemetery)

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25-29	1	1	--	--	--	--	--	--	--	--
	\$44,187	\$44,187	--	--	--	--	--	--	--	--
30-34	2	2	--	--	--	--	--	--	--	--
	44,589	44,589	--	--	--	--	--	--	--	--
35-39	4	--	2	1	1	--	--	--	--	--
	60,879	--	\$54,024	\$62,739	\$72,731	--	--	--	--	--
40-44	2	--	--	1	1	--	--	--	--	--
	75,182	--	--	54,570	95,794	--	--	--	--	--
45-49	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
50-54	8	2	--	2	--	2	2	--	--	--
	69,113	52,866	--	114,559	--	\$54,228	\$54,798	--	--	--
55-59	2	1	--	--	--	1	--	--	--	--
	76,346	54,686	--	--	--	98,006	--	--	--	--
60-64	6	1	--	--	--	2	2	1	--	--
	67,364	50,791	--	--	--	75,112	54,228	\$94,712	--	--
65-69	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	25	7	2	4	2	5	4	1	--	--
	\$65,481	\$49,225	\$54,024	\$86,607	\$84,263	\$71,337	\$54,513	\$94,712	--	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

viii. Rate Group #12 – General – Plans G, H, future service, and U (Law Library)

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
25-29	--	--	--	--	--	--	--	--	--	--
30-34	--	--	--	--	--	--	--	--	--	--
35-39	1	1	--	--	--	--	--	--	--	--
40-44	\$48,479	\$48,479	--	--	--	--	--	--	--	--
45-49	2	--	--	2	--	--	--	--	--	--
50-54	88,199	--	--	\$88,199	--	--	--	--	--	--
55-59	1	--	--	--	1	--	--	--	--	--
60-64	63,472	--	--	--	\$63,472	--	--	--	--	--
65-69	--	--	--	--	--	--	--	--	--	--
70 & over	3	--	--	--	2	--	1	--	--	--
	83,246	--	--	--	88,023	--	\$73,693	--	--	--
	4	--	1	--	1	1	1	--	--	--
	97,100	--	\$52,877	--	63,777	\$81,034	190,711	--	--	--
	1	--	--	--	--	1	--	--	--	--
	63,472	--	--	--	--	63,472	--	--	--	--
	2	--	--	1	--	--	--	1	--	--
	64,907	--	--	48,779	--	--	--	\$81,034	--	--
Total	14	1	1	3	4	2	2	1	--	--
	\$79,984	\$48,479	\$52,877	\$75,059	\$75,824	\$72,253	\$132,202	\$81,034	--	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

ix. Rate Group #6 – Safety – Plans E, F and V (Probation)

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	1	1	--	--	--	--	--	--	--	--
	\$58,971	\$58,971	--	--	--	--	--	--	--	--
25-29	14	7	7	--	--	--	--	--	--	--
	64,796	58,185	\$71,406	--	--	--	--	--	--	--
30-34	43	10	7	26	--	--	--	--	--	--
	68,153	59,174	60,538	\$73,657	--	--	--	--	--	--
35-39	140	3	7	94	36	--	--	--	--	--
	77,226	57,857	60,459	77,170	\$82,248	--	--	--	--	--
40-44	222	--	9	56	139	17	1	--	--	--
	82,352	--	62,813	78,150	83,527	\$97,554	\$71,832	--	--	--
45-49	177	1	--	17	75	76	8	--	--	--
	88,628	53,851	--	73,760	83,346	96,113	102,971	--	--	--
50-54	99	--	--	5	29	29	29	7	--	--
	93,102	--	--	74,199	80,565	93,446	101,755	\$121,277	--	--
55-59	41	--	2	1	8	10	13	7	--	--
	97,255	--	79,204	71,473	83,487	87,801	97,574	134,746	--	--
60-64	21	--	--	1	7	5	6	2	--	--
	84,734	--	--	72,661	78,339	81,317	93,167	96,401	--	--
65-69	5	--	--	1	2	1	1	--	--	--
	80,182	--	--	71,594	65,226	103,995	94,866	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	763	22	32	201	296	138	58	16	--	--
	\$83,961	\$58,429	\$64,704	\$76,548	\$82,788	\$94,649	\$99,462	\$124,060	--	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

x. Rate Group #7 – Safety – Plans E, F, Q, R and V (Law Enforcement)

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	67	66	1	--	--	--	--	--	--	--
	\$78,557	\$78,457	\$85,168	--	--	--	--	--	--	--
25-29	249	152	92	5	--	--	--	--	--	--
	90,141	82,575	101,272	\$115,302	--	--	--	--	--	--
30-34	327	81	166	79	1	--	--	--	--	--
	103,991	87,978	106,456	114,982	\$123,557	--	--	--	--	--
35-39	288	31	82	133	41	1	--	--	--	--
	113,937	99,360	106,281	118,328	125,922	\$118,083	--	--	--	--
40-44	303	17	28	82	135	41	--	--	--	--
	123,235	106,387	114,694	117,568	126,710	135,950	--	--	--	--
45-49	374	7	12	56	102	158	37	2	--	--
	133,477	113,068	123,009	130,375	128,269	138,537	\$136,054	\$172,719	--	--
50-54	261	39	3	20	42	63	80	14	--	--
	135,275	130,386	133,452	127,565	124,743	133,142	140,908	169,300	--	--
55-59	103	24	14	3	7	20	18	17	--	--
	137,387	140,064	141,462	126,125	116,874	138,626	128,096	149,066	--	--
60-64	35	2	9	7	--	3	2	11	1	--
	135,263	125,482	150,331	143,002	--	121,122	118,526	128,240	\$118,173	--
65-69	3	1	--	1	1	--	--	--	--	--
	131,143	141,287	--	138,954	113,189	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	2,010	420	407	386	329	286	137	44	1	--
	\$117,599	\$93,750	\$108,625	\$120,231	\$126,584	\$136,730	\$137,587	\$151,373	\$118,173	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

xi. Rate Group #8 – Safety – Plans E, F, Q, R and V (OCFA)

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	15	15	--	--	--	--	--	--	--	--
	\$78,607	\$78,607	--	--	--	--	--	--	--	--
25-29	74	69	4	1	--	--	--	--	--	--
	94,476	93,827	\$102,663	\$106,530	--	--	--	--	--	--
30-34	139	85	37	17	--	--	--	--	--	--
	104,845	95,549	116,797	125,312	--	--	--	--	--	--
35-39	189	56	62	63	8	--	--	--	--	--
	119,819	101,839	122,728	131,664	\$129,861	--	--	--	--	--
40-44	166	17	53	56	35	5	--	--	--	--
	131,082	103,896	129,932	137,577	132,775	\$151,109	--	--	--	--
45-49	136	3	32	33	32	22	14	--	--	--
	139,358	116,923	136,889	131,811	137,136	150,057	\$155,861	--	--	--
50-54	140	1	27	10	26	30	34	12	--	--
	145,541	133,466	146,135	123,771	143,608	142,736	155,269	\$146,995	--	--
55-59	101	1	35	3	11	14	19	16	2	--
	133,922	83,765	132,250	131,358	127,031	138,025	139,119	136,213	\$133,619	--
60-64	35	2	16	--	1	2	6	2	6	--
	129,912	98,696	128,164	--	117,300	115,119	139,561	143,874	137,711	--
65-69	11	--	5	1	--	--	2	--	3	--
	130,256	--	126,441	140,756	--	--	116,561	--	142,244	--
70 & over	1	--	--	--	--	--	--	--	1	--
	104,570	--	--	--	--	--	--	--	104,570	--
Total	1,007	249	271	184	113	73	75	30	12	--
	\$125,212	\$96,424	\$128,654	\$132,382	\$135,600	\$143,856	\$148,999	\$141,036	\$135,401	--

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT B

**Members in Active Service and Projected Average Compensation as of December 31, 2017
By Age and Years of Service**

xii. Total

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	354	353	1	--	--	--	--	--	--	--
	\$57,682	\$57,604	\$85,168	--	--	--	--	--	--	--
25-29	1,637	1,456	166	15	--	--	--	--	--	--
	63,400	60,517	86,728	\$85,072	--	--	--	--	--	--
30-34	2,498	1,424	596	471	7	--	--	--	--	--
	72,932	66,968	84,960	75,637	\$80,203	--	--	--	--	--
35-39	2,977	874	601	1,154	343	5	--	--	--	--
	81,756	73,184	88,839	85,171	79,754	\$77,753	--	--	--	--
40-44	3,164	602	378	963	1,026	191	4	--	--	--
	85,766	73,665	91,581	86,807	88,129	94,952	\$62,271	--	--	--
45-49	3,384	421	308	737	966	648	301	3	--	--
	92,020	76,843	95,894	89,139	91,803	102,965	93,017	\$138,019	--	--
50-54	3,133	375	235	513	701	494	667	141	7	--
	92,160	83,846	94,584	83,832	87,188	101,538	99,243	98,488	\$100,159	--
55-59	2,361	264	229	397	466	306	463	190	44	2
	88,717	84,356	100,113	84,559	82,074	93,262	90,915	95,368	80,435	\$78,287
60-64	1,446	152	118	233	331	199	239	112	54	8
	83,600	81,049	96,015	77,584	79,689	86,953	83,732	91,072	85,293	82,697
65-69	548	45	52	98	156	67	83	27	15	5
	81,479	88,897	96,295	78,792	77,158	81,466	82,191	69,350	88,696	80,335
70 & over	219	11	11	39	68	32	34	13	6	5
	71,268	58,909	60,222	77,568	73,634	72,901	61,755	82,401	64,226	75,184
Total	21,721	5,977	2,695	4,620	4,064	1,942	1,791	486	126	20
	\$83,416	\$69,458	\$90,841	\$84,389	\$86,074	\$97,342	\$92,389	\$93,754	\$83,824	\$79,787

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT C

Reconciliation of Member Data – December 31, 2016 to December 31, 2017

	Active Members	Vested Former Members⁽¹⁾	Pensioners	Disableds	Beneficiaries	Total
Number as of December 31, 2016	21,746	5,370	12,767	1,419	2,183	43,485
New members	1,425	141	0	0	193	1,759
Terminations – with vested rights	-584	584	0	0	0	0
Contributions refunds	-161	-111	0	0	0	-272
Retirements	-678	-128	806	0	0	0
New disabilities	-31	-7	-27	65	0	0
Return to work	35	-34	-1	0	0	0
Deaths	-31	-12	-308	-37	-105	-493
Data adjustments	<u>0</u>	<u>0</u>	<u>3</u>	<u>-1</u>	<u>-10</u>	<u>-8</u>
Number as of December 31, 2017	21,721	5,803	13,240	1,446	2,261	44,471

⁽¹⁾ Includes members who chose to leave their contributions on deposit even though they have less than five years of service.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT D

Summary Statement of Income and Expenses on an Actuarial Value Basis

	Year Ended December 31, 2017	Year Ended December 31, 2016
Contribution income:		
Employer contributions	\$596,146,000 ⁽¹⁾	\$533,667,000 ⁽²⁾
Member contributions	262,294,000	258,297,000
Discount for prepaid contributions	22,921,000	24,353,000
Transfer from County Investment Account ⁽³⁾	<u>0</u>	<u>0</u>
Contribution income	\$881,361,000	\$816,317,000
Investment income:		
Interest, dividends and other income	\$419,412,000	\$220,524,000
Recognition of capital appreciation	654,094,000	653,783,000
Less investment and administrative fees	<u>(96,378,000)</u>	<u>(97,680,000)</u>
Net investment income	<u>\$977,128,000</u>	<u>\$776,627,000</u>
Total income available for benefits	\$1,858,489,000	\$1,592,944,000
Less benefit payments	\$(764,344,000)	\$(717,976,000)
Change in reserve for future benefits	\$1,094,145,000	\$874,968,000

⁽¹⁾ Includes asset transfer of \$24,042,000 from O.C. Sanitation District UAAL Deferred Account to valuation assets.

⁽²⁾ Excludes contributions towards O.C. Sanitation District UAAL Deferred Account.

⁽³⁾ Funded by pension obligation bond proceeds held by OCERS.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT E

Summary Statement of Assets

	Year Ended December 31, 2017	Year Ended December 31, 2016
Cash equivalents	\$486,846,000	\$456,545,000
Accounts receivable:		
Contributions	\$21,361,000	\$19,206,000
Investment income	13,727,000	15,880,000
Securities settlements	150,619,000	85,263,000
Other	<u>199,651,000</u>	<u>56,019,000</u>
Total accounts receivable	\$385,358,000	\$176,368,000
Investments:		
Fixed income investments	\$2,011,101,000	\$2,051,276,000
Equities	7,305,333,000	4,774,008,000
Real estate	N/A	1,096,693,000
Alternative investments and diversified credit	5,115,269,000	4,692,664,000
Security lending collateral	189,948,000	165,455,000
Fixed assets net of accumulated depreciation	<u>20,670,000</u>	<u>22,620,000</u>
Total investments at market value	<u>\$14,642,321,000</u>	<u>\$12,802,716,000</u>
Total assets	\$15,514,525,000	\$13,435,629,000
Less accounts payable:		
Securities settlements	\$(194,266,000)	\$(157,867,000)
Security lending liability	(189,948,000)	(165,455,000)
All other	<u>(83,864,000)</u>	<u>(80,575,000)</u>
Total accounts payable	\$(468,078,000)	\$(403,897,000)
Net assets at market value⁽¹⁾	<u>\$14,652,607,000</u>	<u>\$12,657,418,000</u>
Net assets at actuarial value	<u>\$14,197,211,000</u>	<u>\$13,103,066,000</u>
Net assets at valuation value	<u>\$14,197,125,000</u>	<u>\$13,102,978,000</u>

⁽¹⁾ The market value excludes \$134,417,000 and \$117,723,000 as of December 31, 2017 and December 31, 2016, respectively, in the County Investment Account (funded by pension obligation bond proceeds held by OCERS), \$244,552,000 and \$222,524,000 as of December 31, 2017 and December 31, 2016, respectively, in the prepaid employer contributions account, \$14,871,000 and \$34,067,000 as of December 31, 2017 and December 31, 2016, respectively in the O.C. Sanitation District UAAL Deferred Account (after transfer).

Note: Results may not total exactly due to rounding.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT F

Actuarial Balance Sheet

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

Assets

1. Total valuation value of assets	\$14,197,125,000
2. Present value of future contributions by members	2,003,365,000
3. Present value of future employer contributions for:	
a. entry age normal cost	2,406,565,000
b. unfunded actuarial accrued liability	<u>5,438,302,000</u>
4. Total current and future assets	\$24,045,357,000

Liabilities

5. Present value of retirement allowance for retirees and beneficiaries	\$10,633,213,000
6. Present value of retirement allowance for inactive members with vested rights ⁽¹⁾	488,752,000
7. Present value of retirement allowances for active members	<u>12,923,392,000</u>
8. Total liabilities	\$24,045,357,000

⁽¹⁾ This includes members who chose to leave their contributions on deposit even though they have less than five years of service.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT G

Summary of Reported Asset Information as of December 31, 2017

Reserves

Included in Valuation Value of Assets

Active Members Reserve (Book Value)	\$3,093,114,000
Retired Members Reserve (Book Value)	9,821,494,000
Employer Advanced Reserve (Book Value)	2,586,106,000
O.C. Sanitation District UAAL Deferred Account Transfer	24,042,000
ERI Contribution Reserve	10,660,000
STAR COLA Contribution Reserve	0
Unrealized Appreciation/(Depreciation) Included in Valuation Value of Assets	<u>-1,338,291,000</u>
Subtotal: Valuation Value of Assets	\$14,197,125,000

Not Included in Valuation Value of Assets

RMBR	\$0
Unclaimed Member Deposit	0
Medicare Medical Insurance Reserve	<u>86,000</u>
Total	\$86,000
Subtotal: Actuarial Value of Assets	\$14,197,211,000
Unrecognized Investment Income	<u>455,396,000</u>
Subtotal: Market Value of Assets (Net of County Investment Account ⁽¹⁾ and Prepaid Employer Contributions)	\$14,652,607,000
County Investment Account ⁽¹⁾	134,417,000
Prepaid Employer Contributions	244,552,000
O.C. Sanitation District UAAL Deferred Account ⁽²⁾	<u>14,871,000</u>
Total: Gross Market Value of Assets	\$15,046,447,000

⁽¹⁾ Funded by pension obligation bond proceeds held by OCERS.

⁽²⁾ After asset transfer of \$24,042,000 from O.C. Sanitation District UAAL Deferred Account to valuation assets.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT H

Development of Unfunded/(Overfunded) Actuarial Accrued Liability for Year Ended December 31, 2017

1.	Unfunded actuarial accrued liability at beginning of year		\$4,830,483,000
2.	Additional UAAL contributions from Children and Families and Law Library to pay-off UAAL		<u>-3,800,000</u>
3.	Unfunded actuarial accrued liability at beginning of year after reflecting additional UAAL contributions from Children and Families and Law Library to pay-off UAAL		\$4,826,683,000
4.	Total normal cost at middle of year		468,525,000
5.	Expected employer and member contributions		-854,874,000
6.	Interest		<u>336,342,000</u>
7.	Expected unfunded actuarial accrued liability		\$4,776,676,000
8.	Actuarial (gain)/loss and other changes:		
	(a) Gain from additional UAAL contributions	-\$36,348,000	
	(b) Loss from actual contributions less than expected	37,726,000	
	(c) Gain from investment return	-24,401,000	
	(d) Gain from lower than expected COLA increases	-95,796,000	
	(e) Gain from higher than expected salary increases	-66,399,000	
	(f) Other experience loss	17,348,000	
	(g) Gain from asset transfer from O.C. Sanitation District UAAL Deferred Account	-24,042,000	
	(h) Changes in actuarial assumptions	<u>853,538,000</u>	
	Total changes		<u>\$661,626,000</u>
9.	Unfunded actuarial accrued liability at end of year		<u>\$5,438,302,000</u>

Note: The sum of 8(d) through 8(f) is equal to the "other experience" gain of \$144,847,000 provided on page 7.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

EXHIBIT I

Section 415 Limitations

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

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

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

Benefits for non-CalPEPRA plans that are 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 for non-CalPEPRA plans 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 Orange County Employees Retirement System

EXHIBIT J

Definitions of Pension Terms

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

Assumptions or Actuarial Assumptions:

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

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of members 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 members 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.

SECTION 3: Supplemental Information for the Orange County Employees Retirement System

**Unfunded/(Overfunded) Actuarial
Accrued Liability:**

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

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

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

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 market gains and losses to avoid significant swings in the value of assets from one year to the next.

SECTION 4: Reporting Information for the Orange County Employees 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 2,261 beneficiaries in pay status)	16,947
2. Members inactive during year ended December 31, 2017 with vested rights ⁽¹⁾	5,803
3. Members active during the year ended December 31, 2017	21,721

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

1. Normal cost	\$508,328
2. Present value of future benefits	24,045,357
3. Present value of future normal costs	4,409,930
4. Actuarial accrued liability ⁽²⁾	19,635,427
Retired members and beneficiaries	\$10,633,213
Inactive members with vested rights ⁽¹⁾	488,752
Active members	8,513,462
5. Valuation value of assets ⁽³⁾ (\$14,652,607 at market value as reported by Retirement System)	14,197,125
6. Unfunded actuarial accrued liability	\$5,438,302

⁽¹⁾ This includes members who chose to leave their contributions on deposit even though they have less than five years of service.

⁽²⁾ Excludes liabilities held for STAR COLA.

⁽³⁾ Excludes assets held for Medicare medical insurance reserve.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

EXHIBIT I (continued)
Summary of Actuarial Valuation Results

The determination of the recommended average employer contribution is as follows (amounts in 000s):

	Dollar Amount	% of Payroll
1. Total normal cost	\$508,328	28.05%
2. Expected member contributions	<u>-228,888</u>	<u>-12.63%</u>
3. Employer normal cost: (1) + (2)	\$279,440	15.42%
4. Amortization of unfunded actuarial accrued liability	<u>408,555</u>	<u>22.55%</u>
5. Total recommended average employer contribution: (3) + (4)	\$687,995	37.97%
6. Projected compensation	\$1,811,877	

SECTION 4: Reporting Information for the Orange County Employees 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 January 1, 2014 through December 31, 2016 Actuarial Experience Study dated August 14, 2017 and PowerPoint presentation dated October 16, 2017. Unless otherwise noted, all actuarial assumptions and methods shown below apply to members for all tiers.
<u>Economic Assumptions</u>	
Net Investment Return:	7.00%; net of investment expenses and administrative expenses.
Member Contribution Crediting Rate:	5.00%, compounded semi-annually.
Consumer Price Index:	Increase of 2.75% per year, retiree COLA increases due to CPI subject to a 3.0% maximum change per year.
Payroll Growth:	Inflation of 2.75% per year plus “across the board” real salary increases of 0.50% per year.
Increase in Section 7522.10 Compensation Limit:	Increase of 2.75% per year from the valuation date.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Individual Salary Increases:

Annual Rate of Compensation Increase (%)

Inflation: 2.75% per year, plus “across the board” real salary increases of 0.50% per year, plus the following merit and promotional increases:

Years of Service	General	Safety
Less than 1	9.00%	14.00%
1	7.25	10.00
2	6.00	7.75
3	5.00	6.00
4	4.00	5.50
5	3.50	4.50
6	2.50	3.75
7	2.25	3.25
8	1.75	2.50
9	1.50	2.25
10	1.50	1.75
11	1.50	1.75
12	1.50	1.75
13	1.50	1.75
14	1.50	1.75
15	1.50	1.75
16	1.00	1.50
17	1.00	1.50
18	1.00	1.50
19	1.00	1.50
20 & over	1.00	1.50

In addition to the individual salary increase assumptions, we have applied an average of two hours of additional salary annually for leap-year salary adjustment.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Demographic Assumptions

Post – Retirement Mortality Rates:

- Healthy:* For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table, projected generationally with the two-dimensional MP-2016 projection scale.
For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set back four years, projected generationally with the two-dimensional MP-2016 projection scale.
- Disabled:* For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set forward five years, projected generationally with the two-dimensional MP-2016 projection scale.
For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table, projected generationally with the two-dimensional MP-2016 projection scale.
- Beneficiaries:* Beneficiaries are assumed to have the same mortality as a General Member of the opposite sex who is receiving a service (non-disability) retirement.

The RP-2014 mortality tables and adjustments as shown above reflect the mortality experience as of the measurement date. The generational projection is a provision for future mortality improvement.

- Member Contribution Rates:* For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 40% male and 60% female.
For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016 set back four years, weighted 80% male and 20% female.
- Optional Forms of Benefits:* For General Service Retirees: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 40% male and 60% female.
For Safety Service Retirees: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016 set back four years, weighted 80% male and 20% female.
For General Disabled Retirees: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016 set forward five years, weighted 40% male and 60% female.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

For Safety Disabled Retirees: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 80% male and 20% female.

For General Beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 60% male and 40% female.

For Safety Beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 20% male and 80% female.

Pre-Retirement Mortality Rates:

For General and Safety Members: Headcount-Weighted RP-2014 Employee Mortality Table times 80%, projected generationally with the two-dimensional MP-2016 projection scale.

Termination Rates Before Retirement:

Age	Rate (%)	
	Mortality (General and Safety)	
	Male	Female
25	0.05	0.02
30	0.05	0.02
35	0.05	0.03
40	0.06	0.04
45	0.10	0.07
50	0.17	0.11
55	0.27	0.17
60	0.45	0.24
65	0.78	0.36
70	1.27	0.59

Note that generational projections beyond the base year (2014) are not reflected in the above mortality rates.

All General pre-retirement deaths are assumed to be non-service connected. For Safety, 90% of pre-retirement deaths are assumed to be non-service connected. The other 10% are assumed to be service connected.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Termination Rates Before Retirement (Continued):

Age	Rate (%)			
	Disability			
	General All Other ⁽¹⁾	General OCTA ⁽²⁾	Safety - Law & Fire ⁽³⁾	Safety - Probation ⁽⁴⁾
20	0.00	0.00	0.00	0.00
25	0.00	0.00	0.01	0.03
30	0.01	0.03	0.04	0.08
35	0.03	0.20	0.14	0.10
40	0.08	0.36	0.23	0.13
45	0.13	0.43	0.40	0.21
50	0.18	0.48	1.10	0.28
55	0.23	0.65	2.40	0.42
60	0.31	1.26	4.80	0.20

⁽¹⁾ 60% of General All Other disabilities are assumed to be service connected disabilities. The other 40% are assumed to be non-service connected.

⁽²⁾ 65% of General OCTA disabilities are assumed to be service connected disabilities. The other 35% are assumed to be non-service connected.

⁽³⁾ 100% of Safety Law Enforcement and Fire disabilities are assumed to be service connected disabilities.

⁽⁴⁾ 75% of Safety Probation disabilities are assumed to be service connected disabilities. The other 25% are assumed to be non-service connected.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Termination Rates Before Retirement (Continued):

<u>Years of Service</u>	Rate (%)			
	General All Other	General OCTA	Safety – Law & Fire	Safety - Probation
0	11.00	17.50	4.50	14.00
1	7.50	11.00	2.50	13.00
2	6.50	9.00	2.00	10.00
3	5.00	8.50	1.50	5.00
4	4.50	7.50	1.25	4.00
5	4.25	7.00	1.00	3.50
6	3.75	4.50	0.95	2.75
7	3.25	4.00	0.90	2.00
8	3.00	3.50	0.85	2.00
9	2.75	3.00	0.80	1.75
10	2.50	3.00	0.75	1.75
11	2.00	3.00	0.65	1.50
12	2.00	3.00	0.60	1.25
13	1.75	2.50	0.55	1.00
14	1.50	2.50	0.50	0.75
15	1.40	2.50	0.45	0.75
16	1.30	2.00	0.40	0.75
17	1.20	1.80	0.35	0.25
18	1.10	1.60	0.30	0.25
19	1.00	1.40	0.25	0.25
20 +	0.90	1.20	0.20	0.25

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Termination Rates Before Retirement (Continued):

Years of Service	Election for Withdrawal of Contributions (%)			
	General All Other	General OCTA	Safety – Law & Fire	Safety - Probation
0 – 4	35.0	40.0	20.0	25.0
5 – 9	30.0	35.0	20.0	25.0
10 – 14	25.0	30.0	20.0	25.0
15 or more	20.0	20.0	20.0	25.0

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Retirement Rates:

Age	Rate (%)							
	General - Enhanced	General - Non-Enhanced ⁽¹⁾	General - SJC (31676.12)	Safety - Law (31664.1) ⁽²⁾	Safety - Law (31664.2) ⁽²⁾	Safety - Fire (31664.1)	Safety - Fire (31664.2)	Safety - Probation ⁽²⁾
48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	30.0	25.0	0.0	12.0	0.0	2.0	0.0	0.0
50	2.5	2.0	3.0	18.0	11.5	5.0	8.0	3.3
51	2.0	2.0	3.0	18.0	12.0	7.0	10.0	3.3
52	2.5	2.0	3.0	17.0	12.7	9.5	11.0	4.3
53	2.5	2.8	3.0	17.0	17.9	10.5	12.0	4.3
54	5.5	2.8	3.0	22.0	18.8	15.0	14.0	7.0
55	15.0	3.3	4.0	22.0	30.7	18.0	24.0	12.0
56	10.0	3.5	5.0	20.0	20.0	20.0	23.0	12.0
57	10.0	5.5	6.0	20.0	20.0	21.0	27.0	18.0
58	11.0	5.5	7.0	20.0	25.0	28.0	27.0	18.0
59	11.0	6.5	9.0	26.0	30.0	28.0	36.0	18.0
60	12.0	9.3	11.0	35.0	40.0	30.0	40.0	20.0
61	12.0	12.0	13.0	35.0	40.0	30.0	40.0	20.0
62	14.0	16.0	15.0	40.0	40.0	35.0	40.0	25.0
63	16.0	16.0	15.0	40.0	40.0	35.0	40.0	40.0
64	16.0	18.0	20.0	40.0	40.0	35.0	40.0	40.0
65	22.0	22.0	20.0	100.0	100.0	100.0	100.0	100.0
66	22.0	28.0	24.0	100.0	100.0	100.0	100.0	100.0
67	23.0	24.0	24.0	100.0	100.0	100.0	100.0	100.0
68	23.0	24.0	24.0	100.0	100.0	100.0	100.0	100.0
69	23.0	20.0	24.0	100.0	100.0	100.0	100.0	100.0
70	25.0	20.0	50.0	100.0	100.0	100.0	100.0	100.0
71	25.0	25.0	50.0	100.0	100.0	100.0	100.0	100.0
72	25.0	25.0	50.0	100.0	100.0	100.0	100.0	100.0
73	25.0	25.0	50.0	100.0	100.0	100.0	100.0	100.0
74	25.0	25.0	50.0	100.0	100.0	100.0	100.0	100.0
75	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

⁽¹⁾ These assumptions are also used for the CalPEPRA 1.62% @ 65 formula (Plan T and Plan W).

⁽²⁾ Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Retirement Rates (Continued):

Age	Rate (%)			
	CalPEPRA 2.5% @ 67 General Formula	CalPEPRA Safety - Probation Formula ⁽¹⁾	CalPEPRA Safety - Law Formula ⁽¹⁾	CalPEPRA Safety - Fire Formula
50	0.0	2.5	11.0	6.0
51	0.0	2.5	11.5	7.0
52	4.0	3.0	12.0	9.0
53	1.5	3.0	16.0	10.0
54	1.5	5.5	17.0	11.5
55	2.5	10.0	28.0	21.0
56	3.5	10.0	18.0	20.0
57	5.5	15.0	17.5	22.0
58	7.5	20.0	22.0	25.0
59	7.5	20.0	26.0	30.0
60	7.5	40.0	40.0	40.0
61	7.5	40.0	40.0	40.0
62	14.0	40.0	40.0	40.0
63	14.0	40.0	40.0	40.0
64	14.0	40.0	40.0	40.0
65	18.0	100.0	100.0	100.0
66	22.0	100.0	100.0	100.0
67	23.0	100.0	100.0	100.0
68	23.0	100.0	100.0	100.0
69	23.0	100.0	100.0	100.0
70	25.0	100.0	100.0	100.0
71	25.0	100.0	100.0	100.0
72	25.0	100.0	100.0	100.0
73	25.0	100.0	100.0	100.0
74	25.0	100.0	100.0	100.0
75	100.0	100.0	100.0	100.0

⁽¹⁾ Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Retirement Age and Benefit for Deferred Vested Members:

For current deferred vested members, we make the following retirement age assumptions:

General Age: 59

Safety Age: 53

We assume that 15% of future General and 25% of future Safety deferred vested members will continue to work for a reciprocal employer. For reciprocals, we assume 4.25% compensation increases for General and 4.75% for Safety per annum.

Liability Calculation for Current Deferred Vested Members:

Liability for a current deferred vested member is calculated based on salary (adjusted with the additional cashout assumptions for non-CalPEPRA members), service, and eligibility for reciprocal benefit as provided by the Retirement System. For those members without salary information that have 3 or more years of service, we used an average salary. For those members without salary information that have less than 3 years of service or for those members without service information, we assumed a refund of account balance.

Future Benefit Accruals:

1.0 year of service per year of employment. There is no assumption to anticipate conversion of unused sick leave at retirement.

Unknown Data for Members:

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

Percent Married:

75% of male members and 55% of female members are assumed to be married at retirement or time of pre-retirement death.

Age of Spouse:

Female (or male) three years younger (or older) than spouse.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Additional Cashout Assumptions:

Non-CalPEPRA Formulas

Additional compensation amounts are expected to be received during a member’s final average earnings period. The percentages used in this valuation are:

	<u>Final One Year Salary</u>	<u>Final Three Year Salary</u>
General Members	3.00%	2.80%
Safety - Probation	3.80%	3.40%
Safety - Law	5.20%	4.60%
Safety - Fire	2.00%	1.70%

The additional cashout assumptions are the same for service and disability retirements.

CalPEPRA Formulas

None

Actuarial Value of Assets:

Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual and the expected return on a market value basis, and is recognized over a five-year period.

Valuation Value of Assets:

The Valuation Value of Assets is the Actuarial Value of Assets reduced by the value of the non-valuation reserves.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Actuarial Cost Method: Entry Age Actuarial Cost Method. Entry Age is the current age minus Vesting Credit. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salaries, with Normal Cost determined as a level percentage of individual salary, as if the current benefit accrual rate had always been in effect. Effective December 31, 2013, the outstanding balance of the UAAL from the December 31, 2012 valuation was combined and re-amortized over a declining 20-year period. Any changes in UAAL due to actuarial gains or losses or due to changes in assumptions or methods will be amortized over separate 20-year periods. Any changes in UAAL due to plan amendments will be amortized over separate 15-year periods and any change in UAAL due to early retirement incentive programs will be amortized over a separate period of up to 5 years.

Please note that for Probation members who have prior benefit service in another OCERS plan, the normal cost rate for the current plan is calculated assuming their Entry Age is the date they entered service with their current plan.

Changes in Actuarial Assumptions and Methods:

Based on the Actuarial Experience Study, the following assumptions were changed. Previously, these assumptions were as follows:

Economic Assumptions

Net Investment Return:

7.25%; net of investment and administrative expenses.

Consumer Price Index:

Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 3.0% maximum change per year.

Payroll Growth:

Inflation of 3.00% per year plus “across the board” real salary increases of 0.50% per year.

Increase in Section 7522.10 Compensation Limit:

Increase of 3.00% per year from the valuation date.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

Individual Salary Increases:

Annual Rate of Compensation Increase (%)

Inflation: 3.00% per year, plus “across the board” real salary increases of 0.50% per year, plus the following merit and promotional increases:

Years of Service	General	Safety
Less than 1	10.00%	14.00%
1	7.25	10.00
2	6.00	8.50
3	4.75	6.75
4	4.00	5.25
5	3.25	4.50
6	2.25	3.50
7	2.00	3.25
8	1.50	2.25
9	1.25	2.25
10	1.25	1.75
11	1.25	1.75
12	1.25	1.75
13	1.25	1.75
14	1.25	1.75
15	1.25	1.75
16	0.75	1.50
17	0.75	1.50
18	0.75	1.50
19	0.75	1.50
20 & over	0.75	1.50

In addition to the individual salary increase assumptions, we have applied an average two hours of additional salary annually for leap-year salary adjustment.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

Demographic Assumptions

Post – Retirement Mortality Rates:

<i>Healthy:</i>	For General Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020. For Safety Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 with ages set back two years.
<i>Disabled:</i>	For General Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 with ages set forward six years for males and set forward three years for females. For Safety Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020.
<i>Beneficiaries:</i>	Beneficiaries are assumed to have the same mortality as a General Member of the opposite sex who is receiving a service (non-disability) retirement.

The mortality tables shown above were determined to contain about a 10% margin to reflect future mortality improvement, based on a review of the mortality experience as of the measurement date.

<i>Member Contribution Rates:</i>	For General Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 weighted 40% male and 60% female. For Safety Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 with ages set back two years weighted 80% male and 20% female.
<i>Optional Forms of Benefits:</i>	For General Service Retirees: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 weighted 40% male and 60% female. For Safety Service Retirees: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 with ages set back two years weighted 80% male and 20% female. For General Disabled Retirees: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 with ages set forward six years for males and set forward three years for females weighted 40% male and 60% female. For Safety Disabled Retirees: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 weighted 80% male and 20% female. For General Beneficiaries: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 weighted 60% male and 40% female. For Safety Beneficiaries: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020 weighted 20% male and 80% female.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

Termination Rates Before Retirement:

Age	Rate (%)			
	Mortality			
	General		Safety	
	Male	Female	Male	Female
25	0.04	0.02	0.04	0.02
30	0.04	0.02	0.04	0.02
35	0.07	0.04	0.06	0.04
40	0.10	0.07	0.09	0.06
45	0.14	0.11	0.12	0.09
50	0.20	0.16	0.18	0.14
55	0.34	0.25	0.27	0.21
60	0.59	0.41	0.48	0.33
65	1.00	0.76	0.82	0.60

All General pre-retirement deaths are assumed to be non-service connected. For Safety, 90% of pre-retirement deaths are assumed to be non-service connected. The other 10% are assumed to be service connected.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

Termination Rates Before Retirement (Continued):

Age	Rate (%)			
	Disability			
	General All Other ⁽¹⁾	General OCTA ⁽²⁾	Safety - Law & Fire ⁽³⁾	Safety - Probation ⁽³⁾
20	0.00	0.00	0.00	0.00
25	0.00	0.00	0.01	0.03
30	0.01	0.03	0.04	0.08
35	0.03	0.20	0.14	0.10
40	0.08	0.36	0.26	0.10
45	0.11	0.43	0.42	0.16
50	0.14	0.48	0.92	0.20
55	0.18	0.74	1.98	0.23
60	0.29	1.41	5.20	0.10

⁽¹⁾ 55% of General All Other disabilities are assumed to be service connected disabilities. The other 45% are assumed to be non-service connected.

⁽²⁾ 65% of General - OCTA disabilities are assumed to be service connected disabilities. The other 35% are assumed to be non-service connected.

⁽³⁾ 100% of Safety – Law Enforcement, Fire and Probation disabilities are assumed to be service connected disabilities.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

Termination Rates Before Retirement (Continued):

Years of Service	Rate (%)			
	General All Other ⁽¹⁾	General OCTA ⁽²⁾	Safety – Law & Fire ⁽³⁾	Safety - Probation ⁽⁴⁾
0	11.00	17.50	4.00	16.00
1	8.00	13.50	3.00	13.00
2	7.00	10.50	2.00	10.00
3	5.00	10.00	1.00	6.00
4	4.00	9.00	1.00	4.00
5	3.75	7.00	1.00	3.50
6	3.50	5.00	0.95	3.00
7	3.00	5.00	0.90	2.50
8	2.75	4.00	0.85	2.25
9	2.50	3.50	0.80	2.00
10	2.25	3.50	0.75	1.75
11	2.00	3.50	0.65	1.75
12	2.00	3.00	0.60	1.50
13	1.75	3.00	0.50	1.25
14	1.75	3.00	0.50	1.00
15	1.75	3.00	0.50	1.00
16	1.50	3.00	0.50	1.00
17	1.50	2.75	0.50	0.50
18	1.50	2.75	0.50	0.50
19	1.50	2.75	0.50	0.50
20 +	1.25	1.75	0.25	0.50

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

- (1) *40% of all terminated members with less than 5 years of service and 25% of all terminated members with 5 or more years of service will choose a refund of contributions.*
- (2) *45% of all terminated members with less than 5 years of service and 35% of all terminated members with 5 or more years of service will choose a refund of contributions.*
- (3) *20% of all terminated members with less than 5 years of service and 20% of all terminated members with 5 or more years of service will choose a refund of contributions.*
- (4) *40% of all terminated members with less than 5 years of service and 30% of all terminated members with 5 or more years of service will choose a refund of contributions.*

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

Retirement Rates:

Age	Rate (%)							
	General - Enhanced	General - Non-Enhanced ⁽¹⁾	General - SJC (31676.12)	Safety - Law (31664.1) ⁽²⁾	Safety - Law (31664.2) ⁽²⁾	Safety - Fire (31664.1) ⁽²⁾	Safety - Fire (31664.2) ⁽²⁾	Safety - Probation ⁽²⁾
49	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
50	2.5	2.5	3.0	16.0	11.5	6.0	8.0	3.0
51	2.0	2.5	3.0	16.0	12.0	8.0	10.0	3.0
52	2.0	2.5	3.0	16.0	12.7	9.0	11.0	4.0
53	2.0	2.5	3.0	16.0	17.9	10.0	12.0	4.0
54	5.0	2.5	3.0	22.0	18.8	16.0	14.0	6.0
55	15.0	3.0	4.0	22.0	30.7	19.0	24.0	11.0
56	10.0	3.5	5.0	20.0	20.0	20.0	23.0	11.0
57	10.0	5.0	6.0	20.0	20.0	23.0	27.0	17.0
58	10.0	5.0	7.0	20.0	25.0	30.0	27.0	20.0
59	11.0	7.0	9.0	26.0	30.0	30.0	36.0	20.0
60	12.0	9.0	11.0	45.0	100.0	45.0	100.0	20.0
61	12.0	10.0	13.0	45.0	100.0	45.0	100.0	20.0
62	15.0	16.0	15.0	45.0	100.0	45.0	100.0	25.0
63	16.0	16.0	15.0	45.0	100.0	45.0	100.0	50.0
64	16.0	18.0	20.0	45.0	100.0	45.0	100.0	50.0
65	21.0	21.0	20.0	100.0	100.0	100.0	100.0	100.0
66	22.0	26.0	24.0	100.0	100.0	100.0	100.0	100.0
67	23.0	21.0	24.0	100.0	100.0	100.0	100.0	100.0
68	23.0	21.0	24.0	100.0	100.0	100.0	100.0	100.0
69	23.0	21.0	24.0	100.0	100.0	100.0	100.0	100.0
70	40.0	30.0	100.0	100.0	100.0	100.0	100.0	100.0
71	40.0	30.0	100.0	100.0	100.0	100.0	100.0	100.0
72	40.0	30.0	100.0	100.0	100.0	100.0	100.0	100.0
73	40.0	30.0	100.0	100.0	100.0	100.0	100.0	100.0
74	40.0	30.0	100.0	100.0	100.0	100.0	100.0	100.0
75	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

⁽¹⁾ These assumptions are also used for the CalPEPRA 1.62% @ 65 formula (Plan T and Plan W).

⁽²⁾ Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

Retirement Rates (continued):

Age	Rate (%)			
	CalPEPRA 2.5% @ 67 General Formula	CalPEPRA Safety - Probation Formula ⁽¹⁾	CalPEPRA Safety - Law Formula ⁽¹⁾	CalPEPRA Safety - Fire Formula ⁽¹⁾
50	0.0	2.5	11.0	6.5
51	0.0	2.5	11.5	8.0
52	4.0	3.0	12.0	9.0
53	1.5	3.0	16.0	10.0
54	1.5	5.5	17.0	12.0
55	2.5	10.0	28.0	21.0
56	3.5	10.0	18.0	20.0
57	5.5	15.0	17.5	22.0
58	7.5	20.0	22.0	25.0
59	7.5	20.0	26.0	31.5
60	7.5	100.0	100.0	100.0
61	7.5	100.0	100.0	100.0
62	14.0	100.0	100.0	100.0
63	14.0	100.0	100.0	100.0
64	14.0	100.0	100.0	100.0
65	18.0	100.0	100.0	100.0
66	22.0	100.0	100.0	100.0
67	23.0	100.0	100.0	100.0
68	23.0	100.0	100.0	100.0
69	23.0	100.0	100.0	100.0
70	30.0	100.0	100.0	100.0
71	30.0	100.0	100.0	100.0
72	30.0	100.0	100.0	100.0
73	30.0	100.0	100.0	100.0
74	30.0	100.0	100.0	100.0
75	100.0	100.0	100.0	100.0

⁽¹⁾ Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Changes in Actuarial Assumptions and Methods (previous assumptions continued):

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

For current deferred vested members, we make the following retirement age assumptions:

General Age:	58
Safety Age:	53

We assume that 20% of future General and 30% of future Safety deferred vested members will continue to work for a reciprocal employer. For reciprocals, we assume 4.25% compensation increases for General and 5.00% for Safety per annum.

Percent Married:

75% of male members and 50% of female members are assumed to be married at retirement or time of pre-retirement death.

Additional Cashout Assumptions:

Non-CalPEPRA Formulas

Additional compensation amounts are expected to be received during a member's final average earnings period. The percentages used in this valuation are:

	<u>Final One</u> <u>Year Salary</u>	<u>Final Three</u> <u>Year Salary</u>
General Members	3.50%	2.80%
Safety - Probation	3.80%	2.80%
Safety - Law	5.20%	4.70%
Safety - Fire	2.00%	2.00%

The additional cashout assumptions are the same for service and disability retirements.

CalPEPRA Formulas

None

SECTION 4: Reporting Information for the Orange County Employees Retirement System

EXHIBIT III
Summary of Plan Provisions

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

Membership Eligibility: Membership with OCERS begins with the day of employment in an eligible position by the County or a participating employer.

Non-CalPEPRA General Plans

2.5% @ 55 Plans (Orange County Sanitation District⁽¹⁾ and Law Library⁽²⁾)

Plan G General members hired before September 21, 1979.

Plan H General members hired on or after September 21, 1979

⁽¹⁾ Sanitation District members within Supervisors and Professional unit hired on or after October 1, 2010 are in Plan B.

⁽²⁾ Improvement is prospective only for service after June 23, 2005.

2.7% @ 55 Plans (City of San Juan Capistrano, Orange County Members except bargaining unit AFSCME members, Orange County Superior Court, Local Agency Formation Commission⁽¹⁾, Orange County Employees Retirement System⁽²⁾, Children and Families Commission⁽³⁾ and Orange County OCFA)

Plan I General members hired before September 21, 1979.

Plan J General members hired on or after September 21, 1979.

⁽¹⁾ Improvement is prospective only for service after June 23, 2005.

⁽²⁾ Improvement for management members is prospective only for service after June 30, 2005.

⁽³⁾ Improvement is prospective only for service after December 22, 2005.

2.0% @ 55 Plans (Transportation Corridor Agency, Cemetery District⁽¹⁾ and General OCFA)

Plan M General members hired before September 21, 1979 and General OCFA members hired on or after July 1, 2011.

Plan N General members hired on or after September 21, 1979.

⁽¹⁾ Improvement is prospective only for service after December 7, 2007.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

1.62% @ 65 Plans (Orange County Members, Orange County Superior Court, Local Agency Formation Commission and County Managers unit)

Plan O County OCEA members and Superior Court members rehired on or after May 7, 2010, LAFCO members rehired on or after July 1, 2010 and County Managers unit members rehired on or after August 17, 2010 and not electing to rejoin Plan I.

Plan P County OCEA members and Superior Court members hired on or after May 7, 2010, LAFCO members hired on or after July 1, 2010 and County Managers unit members hired on or after August 17, 2010 and not electing Plan J.

2.0% @ 57 Plan (City of San Juan Capistrano)

Plan S General members hired on or after July 1, 2012.

All Other General Employers

Plan A General members hired before September 21, 1979.

Plan B General members hired on or after September 21, 1979 and Sanitation District members within Supervisors and Professional unit hired on or after October 1, 2010

Non-CalPEPRA Safety Plans

3% @ 50 Plans (Law Enforcement, OCFA and Probation Members)

Plan E Safety members hired before September 21, 1979.

Plan F Safety members hired on or after September 21, 1979 and before April 9, 2010 for Law Enforcement, before July 1, 2011 for Safety members of OCFA Executive Management, and before July 1, 2012 for other OCFA Safety members.

3% @ 55 Plans (Law Enforcement, OCFA)

Plan Q Safety Law Enforcement members rehired on or after April 9, 2010, Safety members of OCFA Executive Management rehired on or after July 1, 2011, and other OCFA Safety members rehired on or after July 1, 2012 and previously in Plan E.

Plan R Safety Law Enforcement members hired on or after April 9, 2010, Safety members of OCFA Executive Management hired on or after July 1, 2011, and other OCFA Safety members hired on or after July 1, 2012.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

CalPEPRA General Plans

1.62% @ 65 Plan (Orange County Members except County Attorneys, Orange County Employees Retirement System except Management Members, Local Agency Formation Commission, and Orange County Superior Court)

Plan T General members with membership dates on or after January 1, 2013.

2.5% @ 67 Plan (All Other General Employers, Orange County Attorneys, Orange County Employees Retirement System Management Members)

Plan U General Non-Orange County Transportation Authority members with membership dates on or after January 1, 2013 and Orange County Transportation Authority members with membership dates on or after January 1, 2015.

1.62% @ 65 Plan (City of San Juan Capistrano)

Plan W General members with membership dates on or after January 1, 2016 and not electing Plan U.

CalPEPRA Safety Plans

2.7% @ 57 Plan (Law Enforcement, OCFA and Probation Members)

Plan V Safety members with membership dates on or after January 1, 2013.

Final Compensation for Benefit Determination:

Plans A, E, G, I, M, O and Q Highest consecutive twelve months of compensation earnable. (§31462.1) (FAS1)

Plans B, F, H, J, N, P, R and S Highest consecutive thirty-six months of compensation earnable. (§31462) (FAS3)

Plans T Highest consecutive thirty-six months of pensionable compensation. (§7522.32 and §7522.34) (FAS3)

Plans U, V and W Highest consecutive thirty-six months of pensionable compensation. (§7522.10(c), §7522.32 and §7522.34) (FAS3)

Service: Years of service. (Yrs)

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Service Retirement Eligibility:

<i>Plans A, B, G, H, I, J, M, N, O, P, S, T and W</i>	Age 50 with 10 years of service, or age 70 regardless of service, or after 30 years, regardless of age. (§31672)
<i>Plan U</i>	Age 52 with 5 years of service (§7522.20(a)) or age 70 regardless of service (§31672.3).
<i>Plans E, F, Q and R</i>	Age 50 with 10 years of service, or after 20 years, regardless of age. (§31663.25) All part time members over age 55 with 10 years of employment may retire with 5 years of service.
<i>Plan V</i>	Age 50 with 5 years of service. (§7522.20(d)) or age 70 regardless of service (§31672.3).

Benefit Formula:

General Plans

<i>2.5% @ 55</i>	Retirement Age	Benefit Formula
<i>Plan G (§31676.18)</i>	50	(2.00% x FAS1 x Yrs)
	55	(2.50% x FAS1 x Yrs)
	60	(2.50% x FAS1 x Yrs)
	62	(2.62% x FAS1 x Yrs) ⁽¹⁾
	65 or later	(2.62% x FAS1 x Yrs) ⁽¹⁾
<i>Plan H (§31676.18)</i>	50	(2.00% x FAS3 x Yrs)
	55	(2.50% x FAS3 x Yrs)
	60	(2.50% x FAS3 x Yrs)
	62	(2.50% x FAS3 x Yrs)
	65 or later	(2.50% x FAS3 x Yrs)

⁽¹⁾ Reflects benefit factors from Plan A as they provide a better benefit than those under 2.5% @ 55.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Benefit Formula (continued):

	Retirement Age	Benefit Formula
<i>2.7% @ 55</i> <i>Plan I (§31676.19)</i>	50	(2.00% x FAS1 x Yrs)
	55	(2.70% x FAS1 x Yrs)
	60	(2.70% x FAS1 x Yrs)
	62	(2.70% x FAS1 x Yrs)
	65 or later	(2.70% x FAS1 x Yrs)
<i>Plan J (§31676.19)</i>	50	(2.00% x FAS3 x Yrs)
	55	(2.70% x FAS3 x Yrs)
	60	(2.70% x FAS3 x Yrs)
	62	(2.70% x FAS3 x Yrs)
	65 or later	(2.70% x FAS3 x Yrs)

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Benefit Formula (continued):

<i>2.0% @ 55</i>	Retirement Age	Benefit Formula
<i>Plan M (§31676.16)</i>	50	(1.43% x FAS1 x Yrs)
	55	(2.00% x FAS1 x Yrs)
	60	(2.34% x FAS1 x Yrs) ⁽¹⁾
	62	(2.62% x FAS1 x Yrs) ⁽¹⁾
	65 or later	(2.62% x FAS1 x Yrs) ⁽¹⁾
 <i>Plan N (§31676.16)</i>	 50	 (1.43% x FAS3 x Yrs)
	55	(2.00% x FAS3 x Yrs)
	60	(2.26% x FAS3 x Yrs)
	62	(2.37% x FAS3 x Yrs)
	65 or later	(2.43% x FAS3 x Yrs) ⁽²⁾

⁽¹⁾ Reflects benefit factors from Plan A as they provide a better benefit than those under 2.0% @ 55.

⁽²⁾ Reflects benefit factors from Plan B as they provide a better benefit than those under 2.0% @ 55.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Benefit Formula (continued):

	Retirement Age	Benefit Formula
<i>1.62% @ 65</i> <i>Plan O (§31676.01)</i>	50	(0.79% x FAS1 x Yrs)
	55	(0.99% x FAS1 x Yrs)
	60	(1.28% x FAS1 x Yrs)
	62	(1.39% x FAS1 x Yrs)
	65 or later	(1.62% x FAS1 x Yrs)
<i>Plan P, Plan T and Plan W</i> <i>(§31676.01)</i>	50	(0.79% x FAS3 x Yrs)
	55	(0.99% x FAS3 x Yrs)
	60	(1.28% x FAS3 x Yrs)
	62	(1.39% x FAS3 x Yrs)
	65 or later	(1.62% x FAS3 x Yrs)
<i>2.0% @ 57</i> <i>Plan S (§31676.12)</i>	50	(1.34% x FAS3 x Yrs)
	55	(1.77% x FAS3 x Yrs)
	60	(2.34% x FAS3 x Yrs)
	62	(2.62% x FAS3 x Yrs)
	65 or later	(2.62% x FAS3 x Yrs)

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Benefit Formula (continued):

	Retirement Age	Benefit Formula
<i>Plan A (§31676.12)</i>	50	(1.34% x FAS1 x Yrs)
	55	(1.77% x FAS1 x Yrs)
	60	(2.34% x FAS1 x Yrs)
	62	(2.62% x FAS1 x Yrs)
	65 or later	(2.62% x FAS1 x Yrs)
<i>Plan B (§31676.1)</i>	50	(1.18% x FAS3 x Yrs)
	55	(1.49% x FAS3 x Yrs)
	60	(1.92% x FAS3 x Yrs)
	62	(2.09% x FAS3 x Yrs)
	65 or later	(2.43% x FAS3 x Yrs)
<i>Plan U (§7522.20(a))</i>	52	(1.00% x FAS3 x Yrs)
	55	(1.30% x FAS3 x Yrs)
	60	(1.80% x FAS3 x Yrs)
	62	(2.00% x FAS3 x Yrs)
	65	(2.30% x FAS3 x Yrs)
	67 or later	(2.50% x FAS3 x Yrs)

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Benefit Formula (continued):

Safety Plans

	Retirement Age	Benefit Formula
<i>3% @ 50</i>		
<i>Plan E (§31664.1)</i>	50	(3.00% x FAS1 x Yrs)
	55	(3.00% x FAS1 x Yrs)
	60 or later	(3.00% x FAS1 x Yrs)
<i>Plan F (§31664.1)</i>	50	(3.00% x FAS3 x Yrs)
	55	(3.00% x FAS3 x Yrs)
	60 or later	(3.00% x FAS3 x Yrs)
<i>3% @ 55</i>		
<i>Plan Q (§31664.2)</i>	50	(2.29% x FAS1 x Yrs)
	55	(3.00% x FAS1 x Yrs)
	60 or later	(3.00% x FAS1 x Yrs)
<i>Plan R (§31664.2)</i>	50	(2.29% x FAS3 x Yrs)
	55	(3.00% x FAS3 x Yrs)
	60 or later	(3.00% x FAS3 x Yrs)
<i>Plan V (§7522.25(d))</i>	50	(2.00% x FAS3 x Yrs)
	55	(2.50% x FAS3 x Yrs)
	57 or later	(2.70% x FAS3 x Yrs)

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Maximum Benefit:

Plans A, B, E, F, G, H, I, J, M, N, O, P, Q, R, S, T and W 100% of Highest Average Compensation.
(§31676.01, §31676.1, §31676.12, §31676.16, §31676.18, §31676.19, §31664.1, §31664.2)

Plans U and V None.

Ordinary Disability:

General Plans

Plans A, B, G, H, I, J, M, N, O, P, S, T, U and W

Eligibility Five years of service. (§31720)

Benefit Formula Plans A, G, I, M and O:
1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 62, but the total benefit cannot be more than one-third of Final Compensation. (§31727.1)

Plans B, H, J, N, P, S, T, U and W:
1.5% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 65, but the total benefit cannot be more than one-third of Final Compensation. (§31727)

Safety Plans

Plans E, F, Q, R and V

Eligibility Five years of service. (§31720)

Benefit Formula 1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 55, but the total benefit cannot be more than one-third of Final Compensation. (§31727.2)

For all members, 100% of the Service Retirement benefit will be paid, if greater.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Line-of-Duty Disability:

All Members

Eligibility

No age or service requirements. (§31720)

Benefit Formula

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

Pre-Retirement Death:

All Members

Eligibility

None.

Benefit

Refund of member contributions with interest plus one month's compensation for each year of service to a maximum of six month's compensation. (§31781) A lump sum benefit in the amount of \$1,000 is payable upon the death of a member (with 10 years of service) to his/her eligible beneficiary. (§31790)

Death in line of duty

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

OR

Vested Members

Eligibility

Five years of service.

Benefit

60% of the greater of Service or Ordinary Disability Retirement benefit payable to eligible surviving spouse (§31765.1, §31781.1), in lieu of §31781.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Death After Retirement:

All Members

Service or

Ordinary Disability Retirement

60% of member's unmodified allowance continued to eligible spouse. (§31760.1) A lump sum benefit in the amount of \$1,000 is payable upon the death of a member (with 10 years of service) to his/her eligible beneficiary. (§31790) An eligible spouse is a surviving spouse who was married to or registered with the member one year prior to the effective retirement date. Certain surviving spouses or domestic partners may also be eligible if marriage or domestic partnership was at least two years prior to the date of death and the surviving spouse or domestic partner has attained age 55.

Line-of-Duty Disability

100% of member's allowance continued to eligible spouse. (§31786) A lump sum benefit in the amount of \$1,000 is payable upon the death of a member (with 10 years of service) to his/her eligible beneficiary. (§31790)

Withdrawal Benefits:

Less than Five Years of Service

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

Five or More Years of Service

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

Post-retirement

Cost-of-Living Benefits:

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

Supplemental Benefit:

Non-vested supplemental COLA and medical benefits are also paid by the System to eligible retirees and survivors. These benefits have been excluded from this valuation.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Member Contributions:

Please refer to Appendix B for the specific rates.

Non-CalPEPRA General Plans

Plan A

Basic

Provide for an average annuity payable at age 60 equal to 1/200 of FAS1. (§31621.5)

Cost-of-Living

Provide for 50% of future Cost-of-Living costs.

Plan B

Basic

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

Cost-of-Living

Provide for 50% of future Cost-of-Living costs.

Plans G, H, I and J

Basic

Provide for an average annuity payable at age 55 equal to 1/100 of FAS3 (FAS1 for Plans G and I). (§31621.8)

Cost-of-Living

Provide for 50% of future Cost-of-Living costs.

Plan M, N, O and P

Basic

Provide for an average annuity payable at age 60 equal to 1/120 of FAS3 (FAS1 for Plans M and O). (§31621)

Cost-of-Living

Provide for 50% of future Cost-of-Living costs.

Plan S

Basic

Provide for an average annuity at age 60 equal to 1/100 of FAS3. (§31621.2)

Cost-of-Living

Provide for 50% of future Cost-of-Living costs.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Member Contributions (Continued):

Non-CalPEPRA Safety Plans

Plans E and Q

<i>Basic</i>	Provide for an average annuity payable at age 50 equal to 1/200 FAS1. (\$31639.5)
<i>Cost-of-Living</i>	Provide for 50% of future Cost-of-Living costs.

Plans F and R

<i>Basic</i>	Provide for an average annuity payable at age 50 equal to 1/100 of FAS3. (\$31639.25)
<i>Cost-of-Living</i>	Provide for 50% of future Cost-of-Living costs.

CalPEPRA Plans

Plans T, U, V and W

50% of total Normal Cost rate.

Other Information:

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

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

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #2 – Plans I, J, O, P, S, T, U and W						
	12/31/2012	Restart amortization	\$3,438,555,000	16	\$3,366,250,000	\$281,362,000
	12/31/2013	Actuarial (gain) or loss	(173,790,000)	16	(170,136,000)	(14,221,000)
	12/31/2014	Actuarial (gain) or loss	(78,001,000)	17	(77,027,000)	(6,158,000)
	12/31/2014	Assumption changes	(246,714,000)	17	(243,633,000)	(19,477,000)
	12/31/2015	Actuarial (gain) or loss	(65,063,000)	18	(64,689,000)	(4,963,000)
	12/31/2016	Actuarial (gain) or loss	39,445,000	19	<u>39,368,000</u>	<u>2,907,000</u>
Subtotal					\$2,850,133,000	\$239,450,000 ⁽¹⁾
	12/31/2017	Actuarial (gain) or loss	(59,911,000)	20	(59,911,000)	(4,270,000)
	12/31/2017	Assumption changes	481,098,000	20	<u>481,098,000</u>	<u>34,288,000</u>
Subtotal					\$421,187,000	\$30,018,000 ⁽²⁾
Rate Group #2 Subtotal					\$3,271,320,000	\$269,468,000

Note:

We have made an adjustment to the amortization bases to reflect the \$1.7 million additional contributions made by Children and Families Commission to pay off their UAAL as of December 31, 2016. With that adjustment, we have reduced the amortization layers established on or before December 31, 2016 for Rate Group #2 by that amount on a pro-rata basis. The UAAL contribution rate for Children and Families Commission is determined based on the amortization layers established on or after December 31, 2017.

⁽¹⁾ This amount is spread over the payroll for all employers in Rate Group #2 excluding the payroll for Children and Families Commission.

⁽²⁾ This amount is spread over the payroll for all employers in Rate Group #2 including the payroll for Children and Families Commission.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #3 – Plans B, G, H and U (OCSD)						
Rate Group #3 Subtotal					\$0 ⁽¹⁾	\$0

⁽¹⁾ After transfer of \$24,042,000 from O.C. Sanitation District UAAL Deferred Account.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #5 – Plans A, B and U (OCTA)						
	12/31/2012	Restart amortization	\$232,513,000	16	\$227,811,000	\$19,041,000
	12/31/2013	Actuarial (gain) or loss	(13,471,000)	16	(13,198,000)	(1,103,000)
	12/31/2014	Actuarial (gain) or loss	4,522,000	17	4,470,000	357,000
	12/31/2014	Assumption changes	(19,944,000)	17	(19,712,000)	(1,576,000)
	12/31/2015	Actuarial (gain) or loss	(933,000)	18	(928,000)	(71,000)
	12/31/2016	Actuarial (gain) or loss	(9,743,000)	19	(9,732,000)	(719,000)
	12/31/2017	Actuarial (gain) or loss	(9,948,000)	20	(9,948,000)	(709,000)
	12/31/2017	Assumption changes	43,481,000	20	<u>43,481,000</u>	<u>3,099,000</u>
Rate Group #5 Subtotal					\$222,244,000	\$18,319,000

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #9 – Plans M, N and U (TCA)						
	12/31/2012	Restart amortization	\$11,906,000	16	\$11,665,000	\$975,000
	12/31/2013	Actuarial (gain) or loss	(684,000)	16	(670,000)	(56,000)
	12/31/2014	Actuarial (gain) or loss	496,000	17	491,000	39,000
	12/31/2014	Assumption changes	(1,032,000)	17	(1,020,000)	(82,000)
	12/31/2015	Actuarial (gain) or loss	778,000	18	774,000	59,000
	12/31/2016	Actuarial (gain) or loss	(1,535,000)	19	(1,533,000)	(113,000)
	12/31/2017	Actuarial (gain) or loss	(257,000)	20	(257,000)	(18,000)
	12/31/2017	Assumption changes	1,665,000	20	<u>1,665,000</u>	<u>119,000</u>
Rate Group #9 Subtotal					\$11,115,000	\$923,000

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #10 – Plans I, J, M, N and U (OCFA)						
	12/31/2012	Restart amortization	\$72,750,000	16	\$71,278,000	\$5,958,000
	12/31/2013	Actuarial (gain) or loss	(2,659,000)	16	(2,605,000)	(218,000)
	12/31/2014	Actuarial (gain) or loss	(3,755,000)	17	(3,711,000)	(297,000)
	12/31/2014	Assumption changes	(4,489,000)	17	(4,437,000)	(355,000)
	12/31/2015	Actuarial (gain) or loss	626,000	18	623,000	48,000
	12/31/2016	Actuarial (gain) or loss	134,000	19	134,000	10,000
	12/31/2017	Actuarial (gain) or loss	(15,281,000)	20	(15,281,000)	(1,089,000)
	12/31/2017	Assumption changes	9,159,000	20	<u>9,159,000</u>	<u>653,000</u>
Rate Group #10 Subtotal					\$55,160,000	\$4,710,000

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #11 – Plans M and N, future service, and U (Cemetery)						
	12/31/2017	Restart amortization & Assumption changes	\$281,000	20	<u>\$281,000</u>	<u>\$20,000</u>
Rate Group #11 Subtotal					\$281,000	\$20,000

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #12 – Plans G, H, future service, and U (Law Library)						
	12/31/2017	Restart amortization & Assumption changes	\$13,000	20	<u>\$13,000</u>	<u>\$1,000</u>
Rate Group #12 Subtotal					\$13,000	\$1,000

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
<i>Safety Members</i>						
Rate Group #6 – Plans E, F and V (Probation)						
	12/31/2012	Restart amortization	\$192,912,000	16	\$189,010,000	\$15,798,000
	12/31/2013	Actuarial (gain) or loss	(14,039,000)	16	(13,756,000)	(1,150,000)
	12/31/2014	Actuarial (gain) or loss	(2,596,000)	17	(2,566,000)	(205,000)
	12/31/2014	Assumption changes	36,260,000	17	35,837,000	2,865,000
	12/31/2015	Actuarial (gain) or loss	(10,703,000)	18	(10,650,000)	(817,000)
	12/31/2016	Actuarial (gain) or loss	13,799,000	19	13,783,000	1,018,000
	12/31/2017	Actuarial (gain) or loss	(6,566,000)	20	(6,566,000)	(468,000)
	12/31/2017	Assumption changes	50,030,000	20	<u>50,030,000</u>	<u>3,566,000</u>
Rate Group #6 Subtotal					\$255,122,000	\$20,607,000

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #7 – Plans E, F, Q, R and V (Law Enforcement)						
	12/31/2012	Restart amortization	\$988,833,000	16	\$968,834,000	\$80,978,000
	12/31/2013	Actuarial (gain) or loss	(51,652,000)	16	(50,607,000)	(4,230,000)
	12/31/2014	Actuarial (gain) or loss	(34,729,000)	17	(34,324,000)	(2,744,000)
	12/31/2014	Assumption changes	102,262,000	17	101,068,000	8,080,000
	12/31/2015	Actuarial (gain) or loss	23,666,000	18	23,549,000	1,807,000
	12/31/2016	Actuarial (gain) or loss	39,724,000	19	39,679,000	2,930,000
	12/31/2017	Actuarial (gain) or loss	(27,922,000)	20	(27,922,000)	(1,990,000)
	12/31/2017	Assumption changes	161,417,000	20	<u>161,417,000</u>	<u>11,504,000</u>
Rate Group #7 Subtotal					\$1,181,694,000	\$96,335,000

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
Rate Group #8 – Plans E, F, Q, R and V (OCFA)						
	12/31/2012	Restart amortization	\$399,947,000	16	\$391,858,000	\$32,753,000
	12/31/2013	Actuarial (gain) or loss	(20,177,000)	16	(19,769,000)	(1,652,000)
	12/31/2014	Actuarial (gain) or loss	(35,400,000)	17	(34,986,000)	(2,797,000)
	12/31/2014	Assumption changes	35,957,000	17	35,538,000	2,841,000
	12/31/2015	Actuarial (gain) or loss	(22,228,000)	18	(22,119,000)	(1,697,000)
	12/31/2016	Actuarial (gain) or loss	(15,736,000)	19	(15,718,000)	(1,161,000)
	12/31/2017	Actuarial (gain) or loss	(43,031,000)	20	(43,031,000)	(3,067,000)
	12/31/2017	Assumption changes	53,637,000	20	<u>53,637,000</u>	<u>3,823,000</u>
Rate Group #8 Subtotal					\$345,410,000	\$29,043,000

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix A (Continued)

UAAL Amortization Schedule as of December 31, 2017

Rate Groups	Date Established	Source	Initial Base	Years Remaining	Remaining Base	Amortization Amount
All Rate Groups Combined Excluding O.C. Vector Control, Department of Education, U.C.I., Cypress Parks and Recreation and O.C. Sanitation District						
	12/31/2012	Restart amortization	\$5,407,593,000	16	\$5,295,408,000	\$442,606,000
	12/31/2013	Actuarial (gain) or loss	(282,229,000)	16	(276,377,000)	(23,100,000)
	12/31/2014	Actuarial (gain) or loss	(152,205,000)	17	(150,361,000)	(12,022,000)
	12/31/2014	Assumption changes	(104,247,000)	17	(102,824,000)	(8,221,000)
	12/31/2015	Actuarial (gain) or loss	(75,507,000)	18	(75,081,000)	(5,760,000)
	12/31/2016	Actuarial (gain) or loss	56,369,000	19	56,281,000	4,156,000
	12/31/2017	Actuarial (gain) or loss	(168,305,000)	20	(168,305,000)	(11,995,000)
	12/31/2017	Assumption changes	822,683,000	20	<u>822,683,000</u>	<u>58,634,000</u>
Subtotal					\$5,401,424,000	\$444,298,000
		Rate Group #1 – Plans A, B and U (non-OCTA, non-OCSD) for O.C. Vector Control			\$2,052,000	
		Rate Group #1 – Plans A, B and U (non-OCTA, non-OCSD) for Department of Education			\$3,046,000	
		Rate Group #1 – Plans A, B and U (non-OCTA, non-OCSD) for U.C.I.			\$30,927,000	
		Rate Group #1 – Plans A, B and U (non-OCTA, non-OCSD) for Cypress Parks and Recreation			\$853,000	
		Rate Group #3 – Plans B, G, H and U (OCSD)			\$0	
Grand Total					\$5,438,302,000	

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**Appendix B
Member Contribution Rates**

**General Tier 1 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan I (2.7% @ 55 Non-OCFA)</u>		<u>Plan G (2.5% @ 55)</u>		<u>Plan M (2.0% @ 55)*</u>		<u>Plan A (OCTA)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
15	7.51%	10.51%	7.51%	10.31%	5.46%	7.92%	3.28%	5.46%
16	7.51%	10.51%	7.51%	10.31%	5.46%	7.92%	3.28%	5.46%
17	7.63%	10.68%	7.63%	10.47%	5.55%	8.05%	3.33%	5.55%
18	7.75%	10.85%	7.75%	10.64%	5.64%	8.18%	3.38%	5.64%
19	7.87%	11.03%	7.87%	10.81%	5.73%	8.31%	3.44%	5.73%
20	8.00%	11.21%	8.00%	10.99%	5.82%	8.44%	3.49%	5.83%
21	8.13%	11.39%	8.13%	11.16%	5.92%	8.58%	3.55%	5.92%
22	8.26%	11.57%	8.26%	11.34%	6.01%	8.72%	3.61%	6.01%
23	8.39%	11.75%	8.39%	11.53%	6.11%	8.86%	3.67%	6.11%
24	8.53%	11.94%	8.53%	11.71%	6.21%	9.00%	3.72%	6.21%
25	8.66%	12.14%	8.66%	11.90%	6.31%	9.14%	3.78%	6.31%
26	8.81%	12.33%	8.81%	12.09%	6.41%	9.29%	3.84%	6.41%
27	8.95%	12.53%	8.95%	12.29%	6.51%	9.44%	3.91%	6.51%
28	9.09%	12.74%	9.09%	12.49%	6.61%	9.59%	3.97%	6.62%
29	9.24%	12.94%	9.24%	12.69%	6.72%	9.74%	4.03%	6.72%
30	9.39%	13.16%	9.39%	12.90%	6.83%	9.90%	4.10%	6.83%
31	9.55%	13.38%	9.55%	13.11%	6.94%	10.06%	4.16%	6.94%
32	9.71%	13.60%	9.71%	13.33%	7.05%	10.22%	4.23%	7.06%
33	9.87%	13.83%	9.87%	13.56%	7.17%	10.39%	4.30%	7.17%
34	10.04%	14.06%	10.04%	13.79%	7.28%	10.56%	4.37%	7.29%
35	10.21%	14.31%	10.21%	14.03%	7.40%	10.73%	4.44%	7.41%
36	10.39%	14.56%	10.39%	14.27%	7.53%	10.91%	4.52%	7.53%
37	10.58%	14.82%	10.58%	14.53%	7.65%	11.09%	4.59%	7.66%
38	10.77%	15.09%	10.77%	14.80%	7.78%	11.28%	4.67%	7.78%
39	10.92%	15.30%	10.92%	15.00%	7.91%	11.47%	4.75%	7.92%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 1 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan I (2.7% @ 55 Non-OCFA)</u>		<u>Plan G (2.5% @ 55)</u>		<u>Plan M (2.0% @ 55)*</u>		<u>Plan A (OCTA)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
40	11.08%	15.52%	11.08%	15.22%	8.05%	11.67%	4.83%	8.05%
41	11.24%	15.75%	11.24%	15.44%	8.19%	11.88%	4.92%	8.20%
42	11.41%	15.99%	11.41%	15.67%	8.34%	12.09%	5.00%	8.34%
43	11.59%	16.24%	11.59%	15.92%	8.49%	12.31%	5.10%	8.50%
44	11.79%	16.51%	11.79%	16.19%	8.61%	12.48%	5.17%	8.61%
45	12.00%	16.81%	12.00%	16.48%	8.73%	12.66%	5.24%	8.74%
46	12.20%	17.09%	12.20%	16.76%	8.86%	12.85%	5.32%	8.87%
47	12.37%	17.33%	12.37%	16.99%	9.00%	13.04%	5.40%	9.00%
48	12.54%	17.57%	12.54%	17.22%	9.14%	13.25%	5.48%	9.14%
49	12.63%	17.68%	12.63%	17.34%	9.29%	13.47%	5.58%	9.30%
50	12.68%	17.76%	12.68%	17.42%	9.46%	13.71%	5.67%	9.46%
51	12.66%	17.73%	12.66%	17.38%	9.62%	13.94%	5.77%	9.62%
52	12.55%	17.57%	12.55%	17.23%	9.75%	14.14%	5.85%	9.76%
53	12.32%	17.26%	12.32%	16.92%	9.88%	14.33%	5.93%	9.89%
54	11.86%	16.61%	11.86%	16.29%	9.95%	14.43%	5.97%	9.96%
55	11.86%	16.61%	11.86%	16.29%	10.00%	14.49%	6.00%	10.00%
56	11.86%	16.61%	11.86%	16.29%	9.98%	14.46%	5.99%	9.98%
57	11.86%	16.61%	11.86%	16.29%	9.89%	14.34%	5.93%	9.89%
58	11.86%	16.61%	11.86%	16.29%	9.71%	14.08%	5.83%	9.72%
59	11.86%	16.61%	11.86%	16.29%	9.35%	13.55%	5.61%	9.35%
60	11.86%	16.61%	11.86%	16.29%	9.35%	13.55%	5.61%	9.35%
<i>COLA Loading:</i>		<i>40.06%</i>		<i>37.33%</i>		<i>44.97%</i>		<i>66.73%</i>

Interest: 7.00%
Salary Increases: See Exhibit II, page 74
Mortality: See Exhibit II, page 75
Additional Cashouts See Exhibit II, page 83

* Payable by members in Rate Group #9 and Rate Group #11.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 1 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan A (Non-OCTA)</u>		<u>Plan I (2.7% @ 55 OCFA)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
15	3.28%	5.37%	7.51%	10.51%
16	3.28%	5.37%	7.51%	10.51%
17	3.33%	5.46%	7.63%	10.68%
18	3.38%	5.55%	7.75%	10.85%
19	3.44%	5.64%	7.87%	11.03%
20	3.49%	5.73%	8.00%	11.20%
21	3.55%	5.82%	8.13%	11.38%
22	3.61%	5.91%	8.26%	11.57%
23	3.67%	6.01%	8.39%	11.75%
24	3.72%	6.10%	8.53%	11.94%
25	3.78%	6.20%	8.66%	12.13%
26	3.84%	6.30%	8.81%	12.33%
27	3.91%	6.40%	8.95%	12.53%
28	3.97%	6.51%	9.09%	12.73%
29	4.03%	6.61%	9.24%	12.94%
30	4.10%	6.72%	9.39%	13.15%
31	4.16%	6.83%	9.55%	13.37%
32	4.23%	6.94%	9.71%	13.60%
33	4.30%	7.05%	9.87%	13.82%
34	4.37%	7.17%	10.04%	14.06%
35	4.44%	7.28%	10.21%	14.30%
36	4.52%	7.40%	10.39%	14.55%
37	4.59%	7.53%	10.58%	14.81%
38	4.67%	7.65%	10.77%	15.09%
39	4.75%	7.78%	10.92%	15.30%
40	4.83%	7.92%	11.08%	15.51%
41	4.92%	8.06%	11.24%	15.74%
42	5.00%	8.20%	11.41%	15.98%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 1 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan A (Non-OCTA)</u>		<u>Plan I (2.7% @ 55 OCFA)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
43	5.10%	8.35%	11.59%	16.24%
44	5.17%	8.47%	11.79%	16.51%
45	5.24%	8.59%	12.00%	16.80%
46	5.32%	8.72%	12.20%	17.09%
47	5.40%	8.85%	12.37%	17.32%
48	5.48%	8.99%	12.54%	17.56%
49	5.58%	9.14%	12.63%	17.68%
50	5.67%	9.30%	12.68%	17.76%
51	5.77%	9.46%	12.66%	17.72%
52	5.85%	9.59%	12.55%	17.57%
53	5.93%	9.72%	12.32%	17.25%
54	5.97%	9.79%	11.86%	16.61%
55	6.00%	9.83%	11.86%	16.61%
56	5.99%	9.81%	11.86%	16.61%
57	5.93%	9.73%	11.86%	16.61%
58	5.83%	9.55%	11.86%	16.61%
59	5.61%	9.20%	11.86%	16.61%
60	5.61%	9.20%	11.86%	16.61%
<i>COLA Loading:</i>		63.93%	40.02%	
<i>Interest:</i>		7.00%		
<i>Salary Increases:</i>		<i>See Exhibit II, page 74</i>		
<i>Mortality:</i>		<i>See Exhibit II, page 75</i>		
<i>Additional Cashouts</i>		<i>See Exhibit II, page 83</i>		

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 2 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan J (2.7% @ 55 non-OCFA)</u>		<u>Plan H (2.5% @ 55 OCSD)</u>		<u>Plan N (2.0% @ 55)*</u>		<u>Plan B (OCTA)</u>		<u>Plan B (non-OCTA, non-OCSD)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
15	7.18%	10.06%	7.18%	9.87%	5.23%	7.58%	5.23%	7.32%	5.23%	7.24%
16	7.18%	10.06%	7.18%	9.87%	5.23%	7.58%	5.23%	7.32%	5.23%	7.24%
17	7.30%	10.22%	7.30%	10.02%	5.31%	7.70%	5.31%	7.44%	5.31%	7.35%
18	7.42%	10.39%	7.42%	10.19%	5.40%	7.83%	5.40%	7.56%	5.40%	7.47%
19	7.54%	10.55%	7.54%	10.35%	5.49%	7.95%	5.49%	7.68%	5.49%	7.59%
20	7.66%	10.72%	7.66%	10.51%	5.57%	8.08%	5.57%	7.81%	5.57%	7.71%
21	7.78%	10.89%	7.78%	10.68%	5.66%	8.21%	5.66%	7.93%	5.66%	7.84%
22	7.90%	11.07%	7.90%	10.85%	5.75%	8.34%	5.75%	8.06%	5.75%	7.96%
23	8.03%	11.25%	8.03%	11.03%	5.85%	8.47%	5.85%	8.19%	5.85%	8.09%
24	8.16%	11.43%	8.16%	11.20%	5.94%	8.61%	5.94%	8.32%	5.94%	8.22%
25	8.29%	11.61%	8.29%	11.38%	6.03%	8.75%	6.03%	8.45%	6.03%	8.35%
26	8.42%	11.80%	8.42%	11.57%	6.13%	8.89%	6.13%	8.59%	6.13%	8.48%
27	8.56%	11.99%	8.56%	11.75%	6.23%	9.03%	6.23%	8.72%	6.23%	8.62%
28	8.70%	12.18%	8.70%	11.94%	6.33%	9.17%	6.33%	8.86%	6.33%	8.76%
29	8.84%	12.38%	8.84%	12.14%	6.43%	9.32%	6.43%	9.01%	6.43%	8.90%
30	8.98%	12.58%	8.98%	12.34%	6.53%	9.47%	6.53%	9.15%	6.53%	9.04%
31	9.13%	12.79%	9.13%	12.54%	6.64%	9.62%	6.64%	9.30%	6.64%	9.19%
32	9.28%	13.00%	9.28%	12.75%	6.75%	9.78%	6.75%	9.45%	6.75%	9.33%
33	9.44%	13.22%	9.44%	12.96%	6.86%	9.94%	6.86%	9.60%	6.86%	9.48%
34	9.60%	13.44%	9.60%	13.18%	6.97%	10.10%	6.97%	9.76%	6.97%	9.64%
35	9.76%	13.67%	9.76%	13.41%	7.08%	10.26%	7.08%	9.92%	7.08%	9.80%
36	9.93%	13.91%	9.93%	13.64%	7.20%	10.43%	7.20%	10.08%	7.20%	9.96%
37	10.09%	14.14%	10.09%	13.86%	7.32%	10.61%	7.32%	10.25%	7.32%	10.12%
38	10.24%	14.35%	10.24%	14.07%	7.44%	10.78%	7.44%	10.42%	7.44%	10.29%
39	10.38%	14.54%	10.38%	14.26%	7.56%	10.97%	7.56%	10.59%	7.56%	10.47%
40	10.53%	14.75%	10.53%	14.46%	7.69%	11.15%	7.69%	10.78%	7.69%	10.65%
41	10.68%	14.96%	10.68%	14.67%	7.83%	11.35%	7.83%	10.96%	7.83%	10.83%
42	10.84%	15.18%	10.84%	14.89%	7.95%	11.53%	7.95%	11.14%	7.95%	11.01%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 2 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan J (2.7% @ 55 non-OCFA)</u>		<u>Plan H (2.5% @ 55 OCSD)</u>		<u>Plan N (2.0% @ 55)*</u>		<u>Plan B (OCTA)</u>		<u>Plan B (non-OCTA, non-OCSD)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
43	11.01%	15.42%	11.01%	15.12%	8.07%	11.70%	8.07%	11.31%	8.07%	11.17%
44	11.18%	15.65%	11.18%	15.35%	8.18%	11.87%	8.18%	11.46%	8.18%	11.32%
45	11.34%	15.88%	11.34%	15.57%	8.30%	12.03%	8.30%	11.62%	8.30%	11.48%
46	11.48%	16.07%	11.48%	15.76%	8.42%	12.20%	8.42%	11.79%	8.42%	11.65%
47	11.58%	16.21%	11.58%	15.90%	8.54%	12.39%	8.54%	11.96%	8.54%	11.82%
48	11.63%	16.29%	11.63%	15.98%	8.68%	12.58%	8.68%	12.15%	8.68%	12.00%
49	11.63%	16.29%	11.63%	15.97%	8.81%	12.77%	8.81%	12.34%	8.81%	12.19%
50	11.56%	16.19%	11.56%	15.87%	8.93%	12.95%	8.93%	12.51%	8.93%	12.36%
51	11.40%	15.96%	11.40%	15.65%	9.05%	13.11%	9.05%	12.67%	9.05%	12.51%
52	11.12%	15.58%	11.12%	15.28%	9.12%	13.23%	9.12%	12.78%	9.12%	12.62%
53	11.48%	16.08%	11.48%	15.77%	9.17%	13.29%	9.17%	12.84%	9.17%	12.69%
54	11.86%	16.61%	11.86%	16.29%	9.17%	13.29%	9.17%	12.83%	9.17%	12.68%
55	11.86%	16.61%	11.86%	16.29%	9.11%	13.21%	9.11%	12.76%	9.11%	12.60%
56	11.86%	16.61%	11.86%	16.29%	8.98%	13.02%	8.98%	12.58%	8.98%	12.43%
57	11.86%	16.61%	11.86%	16.29%	8.77%	12.71%	8.77%	12.28%	8.77%	12.13%
58	11.86%	16.61%	11.86%	16.29%	9.05%	13.12%	9.05%	12.68%	9.05%	12.52%
59	11.86%	16.61%	11.86%	16.29%	9.35%	13.55%	9.35%	13.09%	9.35%	12.94%
60	11.86%	16.61%	11.86%	16.29%	9.35%	13.55%	9.35%	13.09%	9.35%	12.94%
<i>COLA Loading:</i>		<i>40.06%</i>		<i>37.33%</i>		<i>44.97%</i>		<i>40.04%</i>		<i>38.36%</i>

Interest: 7.00%

Salary Increases: See Exhibit II, page 74

Mortality: See Exhibit II, page 75

Additional Cashouts: See Exhibit II, page 83

* Payable by members in Rate Group #9 and Rate Group #11.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 2 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan J (2.7% @ 55 OCFA)</u>		<u>Plan P (1.62% @ 65)</u>		<u>Plan B (OCSD)</u>		<u>Plan N (OCFA)</u>		<u>Plan S (City of SJC)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
15	7.18%	10.06%	5.23%	6.63%	5.23%	7.28%	5.23%	7.67%	6.28%	8.64%
16	7.18%	10.06%	5.23%	6.63%	5.23%	7.28%	5.23%	7.67%	6.28%	8.64%
17	7.30%	10.22%	5.31%	6.74%	5.31%	7.40%	5.31%	7.80%	6.38%	8.78%
18	7.42%	10.38%	5.40%	6.85%	5.40%	7.52%	5.40%	7.92%	6.48%	8.92%
19	7.54%	10.55%	5.49%	6.96%	5.49%	7.64%	5.49%	8.05%	6.58%	9.07%
20	7.66%	10.72%	5.57%	7.07%	5.57%	7.76%	5.57%	8.18%	6.69%	9.21%
21	7.78%	10.89%	5.66%	7.18%	5.66%	7.89%	5.66%	8.31%	6.80%	9.36%
22	7.90%	11.07%	5.75%	7.30%	5.75%	8.01%	5.75%	8.44%	6.90%	9.51%
23	8.03%	11.24%	5.85%	7.41%	5.85%	8.14%	5.85%	8.58%	7.02%	9.66%
24	8.16%	11.42%	5.94%	7.53%	5.94%	8.27%	5.94%	8.72%	7.13%	9.82%
25	8.29%	11.61%	6.03%	7.65%	6.03%	8.40%	6.03%	8.86%	7.24%	9.97%
26	8.42%	11.79%	6.13%	7.77%	6.13%	8.54%	6.13%	9.00%	7.36%	10.13%
27	8.56%	11.98%	6.23%	7.90%	6.23%	8.68%	6.23%	9.14%	7.47%	10.29%
28	8.70%	12.18%	6.33%	8.03%	6.33%	8.81%	6.33%	9.29%	7.59%	10.46%
29	8.84%	12.38%	6.43%	8.15%	6.43%	8.96%	6.43%	9.44%	7.72%	10.63%
30	8.98%	12.58%	6.53%	8.29%	6.53%	9.10%	6.53%	9.59%	7.84%	10.80%
31	9.13%	12.79%	6.64%	8.42%	6.64%	9.25%	6.64%	9.74%	7.97%	10.97%
32	9.28%	13.00%	6.75%	8.55%	6.75%	9.40%	6.75%	9.90%	8.10%	11.15%
33	9.44%	13.22%	6.86%	8.69%	6.86%	9.55%	6.86%	10.06%	8.23%	11.33%
34	9.60%	13.44%	6.97%	8.83%	6.97%	9.70%	6.97%	10.22%	8.36%	11.51%
35	9.76%	13.67%	7.08%	8.98%	7.08%	9.86%	7.08%	10.39%	8.50%	11.70%
36	9.93%	13.91%	7.20%	9.13%	7.20%	10.02%	7.20%	10.56%	8.64%	11.89%
37	10.09%	14.13%	7.32%	9.28%	7.32%	10.19%	7.32%	10.74%	8.78%	12.09%
38	10.24%	14.34%	7.44%	9.43%	7.44%	10.36%	7.44%	10.92%	8.93%	12.29%
39	10.38%	14.54%	7.56%	9.59%	7.56%	10.54%	7.56%	11.10%	9.08%	12.50%
40	10.53%	14.74%	7.69%	9.76%	7.69%	10.72%	7.69%	11.29%	9.23%	12.72%
41	10.68%	14.96%	7.83%	9.93%	7.83%	10.90%	7.83%	11.49%	9.39%	12.94%
42	10.84%	15.18%	7.95%	10.09%	7.95%	11.08%	7.95%	11.67%	9.55%	13.15%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 2 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan J (2.7% @ 55 OCFA)</u>		<u>Plan P (1.62% @ 65)</u>		<u>Plan B (OCSD)</u>		<u>Plan N (OCFA)</u>		<u>Plan S (City of SJC)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
43	11.01%	15.41%	8.07%	10.24%	8.07%	11.24%	8.07%	11.85%	9.69%	13.34%
44	11.18%	15.65%	8.18%	10.38%	8.18%	11.40%	8.18%	12.01%	9.82%	13.53%
45	11.34%	15.87%	8.30%	10.52%	8.30%	11.56%	8.30%	12.18%	9.96%	13.72%
46	11.48%	16.07%	8.42%	10.68%	8.42%	11.72%	8.42%	12.36%	10.10%	13.91%
47	11.58%	16.21%	8.54%	10.83%	8.54%	11.90%	8.54%	12.54%	10.25%	14.12%
48	11.63%	16.29%	8.68%	11.00%	8.68%	12.08%	8.68%	12.73%	10.41%	14.34%
49	11.63%	16.28%	8.81%	11.17%	8.81%	12.27%	8.81%	12.93%	10.57%	14.56%
50	11.56%	16.18%	8.93%	11.33%	8.93%	12.44%	8.93%	13.11%	10.72%	14.77%
51	11.40%	15.96%	9.05%	11.47%	9.05%	12.60%	9.05%	13.27%	10.85%	14.95%
52	11.12%	15.58%	9.12%	11.57%	9.12%	12.71%	9.12%	13.39%	10.95%	15.08%
53	11.48%	16.08%	9.17%	11.63%	9.17%	12.77%	9.17%	13.46%	11.00%	15.15%
54	11.86%	16.61%	9.17%	11.62%	9.17%	12.76%	9.17%	13.45%	11.00%	15.15%
55	11.86%	16.61%	9.11%	11.55%	9.11%	12.69%	9.11%	13.37%	10.93%	15.05%
56	11.86%	16.61%	8.98%	11.39%	8.98%	12.51%	8.98%	13.19%	10.78%	14.85%
57	11.86%	16.61%	8.77%	11.12%	8.77%	12.21%	8.77%	12.87%	10.52%	14.49%
58	11.86%	16.61%	9.05%	11.48%	9.05%	12.61%	9.05%	13.28%	10.86%	14.96%
59	11.86%	16.61%	9.35%	11.86%	9.35%	13.02%	9.35%	13.72%	11.22%	15.45%
60	11.86%	16.61%	9.35%	11.86%	9.35%	13.02%	9.35%	13.72%	11.22%	15.45%
<i>COLA Loading:</i>		<i>40.02%</i>		<i>26.81%</i>		<i>39.27%</i>		<i>46.76%</i>		<i>37.72%</i>
<i>Interest:</i>	<i>7.00%</i>									
<i>Salary Increases:</i>	<i>See Exhibit II, page 74</i>									
<i>Mortality:</i>	<i>See Exhibit II, page 75</i>									
<i>Additional Cashouts</i>	<i>See Exhibit II, page 83</i>									

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 2 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

Plan H (2.5% @ 55 Law Library)

<u>Entry Age</u>	<u>Normal</u>	<u>Total</u>
15	7.18%	9.87%
16	7.18%	9.87%
17	7.30%	10.03%
18	7.42%	10.19%
19	7.54%	10.35%
20	7.66%	10.52%
21	7.78%	10.69%
22	7.90%	10.86%
23	8.03%	11.03%
24	8.16%	11.21%
25	8.29%	11.39%
26	8.42%	11.57%
27	8.56%	11.76%
28	8.70%	11.95%
29	8.84%	12.14%
30	8.98%	12.34%
31	9.13%	12.55%
32	9.28%	12.75%
33	9.44%	12.97%
34	9.60%	13.19%
35	9.76%	13.41%
36	9.93%	13.65%
37	10.09%	13.87%
38	10.24%	14.07%
39	10.38%	14.27%
40	10.53%	14.47%
41	10.68%	14.68%
42	10.84%	14.89%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General Tier 2 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

Plan H (2.5% @ 55 Law Library)

<u>Entry Age</u>	<u>Normal</u>	<u>Total</u>
43	11.01%	15.12%
44	11.18%	15.36%
45	11.34%	15.57%
46	11.48%	15.77%
47	11.58%	15.90%
48	11.63%	15.98%
49	11.63%	15.98%
50	11.56%	15.88%
51	11.40%	15.66%
52	11.12%	15.28%
53	11.48%	15.78%
54	11.86%	16.30%
55	11.86%	16.30%
56	11.86%	16.30%
57	11.86%	16.30%
58	11.86%	16.30%
59	11.86%	16.30%
60	11.86%	16.30%

COLA Loading: 37.40%

Interest: 7.00%

Salary Increases: See Exhibit II, page 74

Mortality: See Exhibit II, page 75

Additional Cashouts See Exhibit II, page 83

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General CalPEPRA Members' Contribution Rates from the December 31, 2017 Actuarial Valuation
(Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Rate Group 1 – Plan U</u>		<u>Rate Group 2 – Plan T</u>		<u>Rate Group 2 – Plan U</u>		<u>Rate Group 2 – Plan W</u>		<u>Rate Group 3 – Plan U</u>	
	<u>Normal</u>	<u>Total</u>								
15	6.28%	8.50%	3.88%	5.20%	5.60%	7.59%	3.89%	4.90%	5.95%	8.04%
16	6.28%	8.50%	3.88%	5.20%	5.60%	7.59%	3.89%	4.90%	5.95%	8.04%
17	5.99%	8.11%	3.94%	5.28%	5.34%	7.24%	3.96%	4.97%	5.68%	7.67%
18	5.69%	7.70%	4.00%	5.37%	5.07%	6.88%	4.02%	5.05%	5.40%	7.28%
19	5.79%	7.83%	4.07%	5.46%	5.15%	6.99%	4.09%	5.14%	5.48%	7.40%
20	5.88%	7.95%	4.13%	5.54%	5.24%	7.10%	4.15%	5.22%	5.57%	7.52%
21	5.98%	8.08%	4.20%	5.63%	5.32%	7.22%	4.22%	5.30%	5.66%	7.64%
22	6.07%	8.21%	4.27%	5.72%	5.41%	7.34%	4.29%	5.39%	5.75%	7.77%
23	6.17%	8.35%	4.33%	5.81%	5.50%	7.45%	4.36%	5.47%	5.85%	7.89%
24	6.27%	8.48%	4.40%	5.91%	5.58%	7.57%	4.43%	5.56%	5.94%	8.02%
25	6.37%	8.62%	4.47%	6.00%	5.68%	7.70%	4.50%	5.65%	6.04%	8.15%
26	6.47%	8.76%	4.55%	6.10%	5.77%	7.82%	4.57%	5.74%	6.14%	8.28%
27	6.58%	8.90%	4.62%	6.20%	5.86%	7.95%	4.64%	5.84%	6.23%	8.42%
28	6.68%	9.04%	4.69%	6.30%	5.95%	8.07%	4.72%	5.93%	6.33%	8.55%
29	6.79%	9.19%	4.77%	6.40%	6.05%	8.20%	4.79%	6.03%	6.44%	8.69%
30	6.90%	9.34%	4.85%	6.50%	6.15%	8.34%	4.87%	6.12%	6.54%	8.83%
31	7.01%	9.49%	4.93%	6.61%	6.25%	8.47%	4.95%	6.22%	6.64%	8.97%
32	7.12%	9.64%	5.01%	6.72%	6.35%	8.61%	5.03%	6.32%	6.75%	9.11%
33	7.24%	9.79%	5.09%	6.82%	6.45%	8.74%	5.11%	6.43%	6.86%	9.26%
34	7.36%	9.95%	5.17%	6.94%	6.55%	8.89%	5.20%	6.53%	6.97%	9.41%
35	7.47%	10.11%	5.26%	7.05%	6.66%	9.03%	5.28%	6.64%	7.08%	9.56%
36	7.59%	10.27%	5.34%	7.17%	6.76%	9.17%	5.37%	6.75%	7.20%	9.72%
37	7.72%	10.44%	5.43%	7.29%	6.87%	9.32%	5.46%	6.86%	7.31%	9.87%
38	7.84%	10.61%	5.53%	7.41%	6.98%	9.47%	5.55%	6.98%	7.43%	10.03%
39	7.97%	10.78%	5.62%	7.54%	7.10%	9.63%	5.65%	7.10%	7.55%	10.20%
40	8.10%	10.96%	5.72%	7.67%	7.21%	9.78%	5.75%	7.22%	7.68%	10.36%
41	8.23%	11.14%	5.82%	7.81%	7.33%	9.95%	5.85%	7.35%	7.80%	10.53%
42	8.37%	11.32%	5.91%	7.93%	7.45%	10.11%	5.94%	7.47%	7.93%	10.71%
43	8.51%	11.51%	6.00%	8.05%	7.58%	10.28%	6.03%	7.58%	8.06%	10.88%
44	8.65%	11.70%	6.09%	8.17%	7.70%	10.45%	6.12%	7.69%	8.20%	11.07%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General CalPEPRA Members' Contribution Rates from the December 31, 2017 Actuarial Valuation
(Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Rate Group 1 – Plan U</u>		<u>Rate Group 2 – Plan T</u>		<u>Rate Group 2 – Plan U</u>		<u>Rate Group 2 – Plan W</u>		<u>Rate Group 3 – Plan U</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
45	8.80%	11.90%	6.18%	8.29%	7.83%	10.63%	6.21%	7.80%	8.34%	11.25%
46	8.95%	12.10%	6.27%	8.41%	7.97%	10.81%	6.30%	7.92%	8.48%	11.45%
47	9.10%	12.31%	6.36%	8.54%	8.11%	11.00%	6.40%	8.04%	8.63%	11.64%
48	9.26%	12.53%	6.47%	8.68%	8.25%	11.19%	6.50%	8.17%	8.78%	11.85%
49	9.42%	12.74%	6.57%	8.82%	8.39%	11.37%	6.60%	8.30%	8.92%	12.04%
50	9.56%	12.93%	6.67%	8.95%	8.51%	11.55%	6.70%	8.43%	9.06%	12.23%
51	9.69%	13.11%	6.76%	9.07%	8.63%	11.71%	6.79%	8.54%	9.19%	12.40%
52	9.83%	13.30%	6.83%	9.16%	8.76%	11.88%	6.86%	8.62%	9.32%	12.58%
53	9.98%	13.50%	6.87%	9.22%	8.89%	12.06%	6.91%	8.68%	9.46%	12.77%
54	10.13%	13.71%	6.88%	9.23%	9.03%	12.24%	6.92%	8.69%	9.60%	12.96%
55	10.30%	13.93%	6.86%	9.20%	9.17%	12.44%	6.89%	8.67%	9.76%	13.17%
56	10.46%	14.15%	6.79%	9.11%	9.32%	12.64%	6.83%	8.58%	9.91%	13.38%
57	10.62%	14.37%	6.67%	8.95%	9.46%	12.83%	6.71%	8.43%	10.06%	13.59%
58	10.76%	14.56%	6.89%	9.24%	9.59%	13.00%	6.92%	8.70%	10.20%	13.77%
59	10.87%	14.70%	7.12%	9.55%	9.68%	13.13%	7.15%	8.99%	10.30%	13.91%
60	10.94%	14.80%	7.12%	9.55%	9.75%	13.22%	7.15%	8.99%	10.37%	14.00%
61	10.96%	14.83%	7.12%	9.55%	9.76%	13.24%	7.15%	8.99%	10.39%	14.02%
62	10.92%	14.78%	7.12%	9.55%	9.73%	13.20%	7.15%	8.99%	10.35%	13.97%
63	10.82%	14.63%	7.12%	9.55%	9.63%	13.07%	7.15%	8.99%	10.25%	13.84%
64	10.62%	14.37%	7.12%	9.55%	9.46%	12.83%	7.15%	8.99%	10.07%	13.59%
65	10.97%	14.84%	7.12%	9.55%	9.77%	13.25%	7.15%	8.99%	10.39%	14.03%
66 and thereafter	11.33%	15.33%	7.12%	9.55%	10.09%	13.69%	7.15%	8.99%	10.74%	14.49%
COLA Loading:		35.27%		34.15%		35.63%		25.70%		34.99%
Interest:		7.00%								
Salary Increases:		See Exhibit II, page 74								
Mortality:		See Exhibit II, page 75								

It is our understanding that in the determination of pension benefits under the CalPEPRA 2.5% at 67 formula and the Plan W 1.62% at 65 formula, the compensation that can be taken into account for 2018 is equal to \$145,666 (reference: Section 7522.10). This amount should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2018 (reference: Section 7522.10(d)).

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**General CalPEPRA Members' Contribution Rates from the December 31, 2017 Actuarial Valuation
(Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Rate Group 5 – Plan U</u>		<u>Rate Group 9 – Plan U</u>		<u>Rate Group 10 – Plan U</u>		<u>Rate Group 11 – Plan U</u>		<u>Rate Group 12 – Plan U</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
15	6.56%	8.89%	5.92%	7.97%	6.13%	8.30%	6.65%	8.58%	5.19%	7.99%
16	6.56%	8.89%	5.92%	7.97%	6.13%	8.30%	6.65%	8.58%	5.19%	7.99%
17	6.26%	8.48%	5.65%	7.60%	5.85%	7.92%	6.35%	8.19%	4.95%	7.62%
18	5.94%	8.06%	5.37%	7.22%	5.55%	7.52%	6.03%	7.78%	4.71%	7.24%
19	6.04%	8.19%	5.45%	7.34%	5.64%	7.64%	6.12%	7.90%	4.78%	7.36%
20	6.14%	8.32%	5.54%	7.46%	5.74%	7.77%	6.22%	8.03%	4.86%	7.48%
21	6.24%	8.45%	5.63%	7.58%	5.83%	7.89%	6.33%	8.16%	4.94%	7.60%
22	6.34%	8.59%	5.72%	7.70%	5.92%	8.02%	6.43%	8.29%	5.02%	7.72%
23	6.44%	8.73%	5.82%	7.83%	6.02%	8.15%	6.53%	8.43%	5.10%	7.85%
24	6.55%	8.87%	5.91%	7.95%	6.12%	8.28%	6.64%	8.56%	5.18%	7.97%
25	6.65%	9.02%	6.01%	8.08%	6.22%	8.42%	6.74%	8.70%	5.27%	8.10%
26	6.76%	9.16%	6.10%	8.21%	6.32%	8.55%	6.85%	8.84%	5.35%	8.23%
27	6.87%	9.31%	6.20%	8.34%	6.42%	8.69%	6.96%	8.99%	5.44%	8.36%
28	6.98%	9.46%	6.30%	8.48%	6.52%	8.83%	7.08%	9.13%	5.52%	8.50%
29	7.09%	9.61%	6.40%	8.61%	6.63%	8.97%	7.19%	9.28%	5.61%	8.64%
30	7.20%	9.76%	6.51%	8.75%	6.73%	9.11%	7.31%	9.43%	5.70%	8.77%
31	7.32%	9.92%	6.61%	8.89%	6.84%	9.26%	7.42%	9.58%	5.79%	8.92%
32	7.44%	10.08%	6.72%	9.04%	6.95%	9.41%	7.54%	9.73%	5.89%	9.06%
33	7.56%	10.24%	6.82%	9.18%	7.06%	9.56%	7.66%	9.89%	5.98%	9.20%
34	7.68%	10.41%	6.93%	9.33%	7.18%	9.72%	7.79%	10.05%	6.08%	9.35%
35	7.80%	10.57%	7.05%	9.48%	7.29%	9.87%	7.91%	10.21%	6.18%	9.50%
36	7.93%	10.75%	7.16%	9.63%	7.41%	10.03%	8.04%	10.37%	6.28%	9.66%
37	8.06%	10.92%	7.27%	9.79%	7.53%	10.19%	8.17%	10.54%	6.38%	9.81%
38	8.19%	11.10%	7.39%	9.95%	7.65%	10.36%	8.30%	10.71%	6.48%	9.97%
39	8.32%	11.28%	7.51%	10.11%	7.77%	10.53%	8.44%	10.89%	6.59%	10.13%
40	8.45%	11.46%	7.64%	10.27%	7.90%	10.70%	8.57%	11.06%	6.69%	10.30%
41	8.59%	11.65%	7.76%	10.44%	8.03%	10.87%	8.71%	11.24%	6.80%	10.47%
42	8.74%	11.84%	7.89%	10.61%	8.16%	11.05%	8.86%	11.43%	6.92%	10.64%
43	8.88%	12.04%	8.02%	10.79%	8.30%	11.24%	9.01%	11.62%	7.03%	10.82%
44	9.03%	12.24%	8.15%	10.97%	8.44%	11.43%	9.16%	11.81%	7.15%	11.00%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

General CalPEPRA Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll) Calculated Under Recommended Assumptions

<u>Entry Age</u>	<u>Rate Group 5 – Plan U</u>		<u>Rate Group 9 – Plan U</u>		<u>Rate Group 10 – Plan U</u>		<u>Rate Group 11 – Plan U</u>		<u>Rate Group 12 – Plan U</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
45	9.18%	12.45%	8.29%	11.16%	8.58%	11.62%	9.31%	12.01%	7.27%	11.19%
46	9.34%	12.66%	8.43%	11.35%	8.73%	11.82%	9.47%	12.22%	7.39%	11.38%
47	9.50%	12.88%	8.58%	11.55%	8.88%	12.02%	9.64%	12.43%	7.52%	11.57%
48	9.67%	13.11%	8.73%	11.75%	9.04%	12.23%	9.81%	12.65%	7.66%	11.78%
49	9.83%	13.32%	8.88%	11.94%	9.19%	12.44%	9.97%	12.86%	7.78%	11.97%
50	9.98%	13.53%	9.01%	12.12%	9.33%	12.63%	10.12%	13.06%	7.90%	12.15%
51	10.12%	13.72%	9.14%	12.30%	9.46%	12.80%	10.26%	13.24%	8.01%	12.33%
52	10.26%	13.91%	9.27%	12.47%	9.59%	12.99%	10.41%	13.43%	8.13%	12.50%
53	10.42%	14.12%	9.41%	12.66%	9.74%	13.18%	10.56%	13.63%	8.25%	12.69%
54	10.58%	14.34%	9.55%	12.85%	9.89%	13.38%	10.73%	13.84%	8.37%	12.88%
55	10.75%	14.57%	9.71%	13.06%	10.04%	13.60%	10.90%	14.06%	8.51%	13.09%
56	10.92%	14.80%	9.86%	13.27%	10.21%	13.82%	11.08%	14.29%	8.65%	13.30%
57	11.09%	15.03%	10.01%	13.47%	10.36%	14.03%	11.24%	14.51%	8.78%	13.50%
58	11.23%	15.23%	10.15%	13.65%	10.50%	14.22%	11.39%	14.70%	8.90%	13.69%
59	11.35%	15.38%	10.25%	13.79%	10.60%	14.36%	11.51%	14.85%	8.98%	13.82%
60	11.42%	15.48%	10.31%	13.88%	10.67%	14.45%	11.58%	14.94%	9.04%	13.91%
61	11.44%	15.51%	10.33%	13.90%	10.69%	14.48%	11.60%	14.97%	9.06%	13.94%
62	11.40%	15.45%	10.30%	13.85%	10.66%	14.43%	11.56%	14.92%	9.03%	13.89%
63	11.29%	15.30%	10.20%	13.72%	10.55%	14.29%	11.45%	14.77%	8.94%	13.75%
64	11.09%	15.03%	10.02%	13.48%	10.36%	14.03%	11.25%	14.51%	8.78%	13.51%
65	11.45%	15.52%	10.34%	13.91%	10.70%	14.49%	11.61%	14.98%	9.06%	13.95%
66 and thereafter	11.83%	16.03%	10.68%	14.37%	11.05%	14.96%	11.99%	15.47%	9.36%	14.41%
<i>COLA Loading:</i>		<i>35.55%</i>		<i>34.55%</i>		<i>35.39%</i>		<i>29.03%</i>		<i>53.85%</i>
<i>Interest:</i>	<i>7.00%</i>									
<i>Salary Increases:</i>	<i>See Exhibit II, page 74</i>									
<i>Mortality:</i>	<i>See Exhibit II, page 75</i>									

It is our understanding that in the determination of pension benefits under the CalPEPRA 2.5% at 67 formula and the Plan W 1.62% at 65 formula, the compensation that can be taken into account for 2018 is equal to \$145,666 (reference: Section 7522.10). This amount should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2018 (reference: Section 7522.10(d)).

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**Safety Tier 1 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan E (OCFA)</u>		<u>Plan E (Law Enforcement)</u>		<u>Plan E (Probation)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
15	4.66%	11.11%	4.80%	11.58%	4.74%	10.97%
16	4.66%	11.11%	4.80%	11.58%	4.74%	10.97%
17	4.72%	11.26%	4.86%	11.74%	4.80%	11.12%
18	4.78%	11.41%	4.93%	11.89%	4.86%	11.26%
19	4.85%	11.56%	4.99%	12.05%	4.93%	11.41%
20	4.91%	11.71%	5.06%	12.21%	4.99%	11.57%
21	4.98%	11.87%	5.13%	12.37%	5.06%	11.72%
22	5.04%	12.03%	5.20%	12.54%	5.13%	11.88%
23	5.11%	12.19%	5.27%	12.71%	5.20%	12.04%
24	5.18%	12.36%	5.34%	12.88%	5.27%	12.20%
25	5.25%	12.53%	5.41%	13.06%	5.34%	12.37%
26	5.33%	12.70%	5.49%	13.24%	5.42%	12.54%
27	5.40%	12.88%	5.56%	13.42%	5.49%	12.72%
28	5.48%	13.07%	5.64%	13.61%	5.57%	12.90%
29	5.56%	13.26%	5.72%	13.81%	5.65%	13.09%
30	5.64%	13.45%	5.81%	14.01%	5.73%	13.28%
31	5.73%	13.66%	5.90%	14.22%	5.82%	13.48%
32	5.81%	13.87%	5.99%	14.44%	5.91%	13.69%
33	5.91%	14.09%	6.08%	14.67%	6.01%	13.91%
34	5.99%	14.29%	6.17%	14.88%	6.09%	14.10%
35	6.08%	14.50%	6.26%	15.10%	6.18%	14.31%
36	6.17%	14.73%	6.35%	15.33%	6.28%	14.53%
37	6.28%	14.97%	6.46%	15.58%	6.38%	14.77%
38	6.38%	15.23%	6.57%	15.84%	6.49%	15.02%
39	6.51%	15.52%	6.69%	16.14%	6.61%	15.30%
40	6.61%	15.77%	6.79%	16.39%	6.71%	15.55%
41	6.71%	16.01%	6.90%	16.64%	6.82%	15.78%
42	6.79%	16.19%	6.97%	16.81%	6.89%	15.95%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**Safety Tier 1 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan E (OCFA)</u>		<u>Plan E (Law Enforcement)</u>		<u>Plan E (Probation)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
43	6.85%	16.33%	7.03%	16.95%	6.95%	16.09%
44	6.88%	16.41%	7.06%	17.02%	6.98%	16.16%
45	6.87%	16.40%	7.04%	16.99%	6.97%	16.14%
46	6.86%	16.37%	7.02%	16.93%	6.95%	16.10%
47	6.78%	16.18%	6.92%	16.69%	6.86%	15.89%
48	6.62%	15.78%	6.71%	16.19%	6.67%	15.45%
49	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
50	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
51	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
52	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
53	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
54	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
55	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
56	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
57	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
58	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
59	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
60	6.27%	14.95%	6.27%	15.12%	6.27%	14.51%
<i>COLA Loading:</i>		<i>138.56%</i>	<i>141.26%</i>		<i>131.56%</i>	
<i>Interest:</i>		<i>7.00%</i>				
<i>Salary Increases:</i>		<i>See Exhibit II, page 74</i>				
<i>Mortality:</i>		<i>See Exhibit II, page 75</i>				
<i>Additional Cashouts</i>		<i>See Exhibit II, page 83</i>				

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**Safety Tier 2 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan F (OCFA)</u>		<u>Plan F (Law Enforcement)</u>		<u>Plan F (Probation)</u>		<u>Plan R (OCFA)</u>		<u>Plan R (Law Enforcement)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
15	8.87%	15.01%	9.11%	15.54%	9.01%	14.93%	8.87%	14.21%	9.11%	14.56%
16	8.87%	15.01%	9.11%	15.54%	9.01%	14.93%	8.87%	14.21%	9.11%	14.56%
17	8.99%	15.21%	9.22%	15.74%	9.13%	15.13%	8.99%	14.39%	9.22%	14.75%
18	9.10%	15.41%	9.34%	15.94%	9.24%	15.33%	9.10%	14.58%	9.34%	14.94%
19	9.22%	15.61%	9.47%	16.15%	9.37%	15.53%	9.22%	14.77%	9.47%	15.14%
20	9.35%	15.82%	9.59%	16.37%	9.49%	15.73%	9.35%	14.97%	9.59%	15.34%
21	9.47%	16.03%	9.72%	16.58%	9.62%	15.94%	9.47%	15.17%	9.72%	15.54%
22	9.60%	16.25%	9.85%	16.80%	9.74%	16.15%	9.60%	15.37%	9.85%	15.74%
23	9.73%	16.47%	9.98%	17.03%	9.87%	16.37%	9.73%	15.58%	9.98%	15.95%
24	9.86%	16.69%	10.11%	17.26%	10.01%	16.59%	9.86%	15.79%	10.11%	16.17%
25	10.00%	16.92%	10.25%	17.49%	10.14%	16.82%	10.00%	16.01%	10.25%	16.39%
26	10.13%	17.15%	10.39%	17.73%	10.28%	17.05%	10.13%	16.23%	10.39%	16.61%
27	10.28%	17.39%	10.53%	17.98%	10.43%	17.29%	10.28%	16.46%	10.53%	16.84%
28	10.42%	17.64%	10.68%	18.23%	10.57%	17.53%	10.42%	16.69%	10.68%	17.08%
29	10.57%	17.90%	10.83%	18.49%	10.73%	17.78%	10.57%	16.93%	10.83%	17.32%
30	10.73%	18.16%	10.99%	18.75%	10.88%	18.04%	10.73%	17.18%	10.99%	17.57%
31	10.89%	18.44%	11.15%	19.03%	11.05%	18.31%	10.89%	17.44%	11.15%	17.83%
32	11.05%	18.71%	11.31%	19.31%	11.21%	18.58%	11.05%	17.70%	11.31%	18.09%
33	11.21%	18.97%	11.47%	19.58%	11.36%	18.84%	11.21%	17.95%	11.47%	18.34%
34	11.37%	19.24%	11.63%	19.85%	11.52%	19.10%	11.37%	18.20%	11.63%	18.60%
35	11.53%	19.52%	11.80%	20.13%	11.69%	19.38%	11.53%	18.47%	11.80%	18.86%
36	11.71%	19.82%	11.97%	20.42%	11.86%	19.67%	11.71%	18.75%	11.97%	19.14%
37	11.90%	20.14%	12.16%	20.74%	12.05%	19.98%	11.90%	19.06%	12.16%	19.44%
38	12.08%	20.46%	12.34%	21.05%	12.23%	20.28%	12.08%	19.35%	12.34%	19.73%
39	12.26%	20.76%	12.51%	21.35%	12.41%	20.57%	12.26%	19.64%	12.51%	20.00%
40	12.41%	21.00%	12.65%	21.58%	12.55%	20.80%	12.41%	19.87%	12.65%	20.22%
41	12.52%	21.20%	12.75%	21.75%	12.65%	20.98%	12.52%	20.05%	12.75%	20.38%
42	12.59%	21.31%	12.80%	21.84%	12.71%	21.07%	12.59%	20.16%	12.80%	20.47%
43	12.60%	21.33%	12.79%	21.82%	12.71%	21.07%	12.60%	20.18%	12.79%	20.45%
44	12.56%	21.26%	12.72%	21.71%	12.66%	20.98%	12.56%	20.12%	12.72%	20.34%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**Safety Tier 2 Members' Contribution Rates from the December 31, 2017 Actuarial Valuation (Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Plan F (OCFA)</u>		<u>Plan F (Law Enforcement)</u>		<u>Plan F (Probation)</u>		<u>Plan R (OCFA)</u>		<u>Plan R (Law Enforcement)</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
45	12.44%	21.06%	12.57%	21.45%	12.52%	20.75%	12.44%	19.93%	12.57%	20.10%
46	12.21%	20.66%	12.28%	20.96%	12.25%	20.31%	12.21%	19.55%	12.28%	19.64%
47	11.77%	19.93%	11.77%	20.09%	11.77%	19.52%	11.77%	18.85%	11.77%	18.82%
48	12.14%	20.56%	12.14%	20.72%	12.14%	20.13%	12.14%	19.45%	12.14%	19.42%
49	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
50	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
51	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
52	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
53	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
54	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
55	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
56	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
57	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
58	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
59	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
60	12.54%	21.22%	12.54%	21.39%	12.54%	20.78%	12.54%	20.08%	12.54%	20.04%
<i>COLA Loading:</i>		69.28%		70.63%		65.78%		60.16%		59.89%
<i>Interest:</i>	7.00%									
<i>Salary Increases:</i>	See Exhibit II, page 74									
<i>Mortality:</i>	See Exhibit II, page 75									
<i>Additional Cashouts</i>	See Exhibit II, page 83									

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**Safety CalPEPRA Members' Contribution Rates from the December 31, 2017 Actuarial Valuation
(Expressed as a Percentage of Monthly Payroll)
Calculated Under Recommended Assumptions**

<u>Entry Age</u>	<u>Rate Group 6 – Plan V</u>		<u>Rate Group 7 – Plan V</u>		<u>Rate Group 8 – Plan V</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
15	9.82%	14.02%	10.87%	15.53%	9.11%	13.13%
16	9.82%	14.02%	10.87%	15.53%	9.11%	13.13%
17	9.94%	14.21%	11.01%	15.73%	9.23%	13.30%
18	10.07%	14.39%	11.15%	15.93%	9.35%	13.47%
19	10.21%	14.58%	11.30%	16.14%	9.47%	13.65%
20	10.34%	14.77%	11.44%	16.35%	9.60%	13.83%
21	10.47%	14.96%	11.59%	16.57%	9.72%	14.01%
22	10.61%	15.16%	11.75%	16.78%	9.85%	14.19%
23	10.75%	15.36%	11.90%	17.00%	9.98%	14.38%
24	10.89%	15.56%	12.06%	17.23%	10.11%	14.56%
25	11.04%	15.76%	12.22%	17.45%	10.24%	14.76%
26	11.18%	15.97%	12.38%	17.69%	10.38%	14.95%
27	11.33%	16.19%	12.54%	17.92%	10.52%	15.15%
28	11.48%	16.40%	12.71%	18.16%	10.66%	15.35%
29	11.64%	16.62%	12.88%	18.41%	10.80%	15.56%
30	11.80%	16.85%	13.06%	18.66%	10.95%	15.77%
31	11.96%	17.08%	13.24%	18.91%	11.10%	15.99%
32	12.12%	17.32%	13.42%	19.17%	11.25%	16.21%
33	12.29%	17.56%	13.61%	19.44%	11.41%	16.44%
34	12.47%	17.81%	13.80%	19.72%	11.57%	16.67%
35	12.64%	18.06%	14.00%	20.00%	11.74%	16.91%
36	12.83%	18.33%	14.20%	20.29%	11.91%	17.15%
37	13.02%	18.60%	14.41%	20.59%	12.09%	17.41%
38	13.22%	18.88%	14.63%	20.91%	12.27%	17.67%
39	13.41%	19.16%	14.85%	21.22%	12.45%	17.94%
40	13.61%	19.44%	15.06%	21.53%	12.63%	18.20%
41	13.80%	19.72%	15.28%	21.83%	12.81%	18.46%
42	14.01%	20.01%	15.51%	22.16%	13.00%	18.73%
43	14.23%	20.32%	15.75%	22.50%	13.21%	19.03%
44	14.46%	20.66%	16.01%	22.87%	13.43%	19.34%

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**Safety CalPEPRA Members' Contribution Rates from the December 31, 2017 Actuarial Valuation
(Expressed as a Percentage of Monthly Payroll)**

Calculated Under Recommended Assumptions

<u>Entry Age</u>	<u>Rate Group 6 – Plan V</u>		<u>Rate Group 7 – Plan V</u>		<u>Rate Group 8 – Plan V</u>	
	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>	<u>Normal</u>	<u>Total</u>
45	14.69%	20.99%	16.27%	23.24%	13.64%	19.65%
46	14.92%	21.31%	16.51%	23.59%	13.85%	19.95%
47	15.10%	21.57%	16.72%	23.89%	14.02%	20.20%
48	15.25%	21.78%	16.88%	24.12%	14.16%	20.39%
49	15.34%	21.92%	16.98%	24.27%	14.24%	20.52%
50	15.37%	21.96%	17.02%	24.31%	14.27%	20.56%
51	15.34%	21.92%	16.98%	24.27%	14.24%	20.52%
52	15.22%	21.75%	16.85%	24.08%	14.13%	20.36%
53	14.97%	21.39%	16.57%	23.68%	13.90%	20.02%
54	14.49%	20.71%	16.04%	22.93%	13.46%	19.38%
55	14.95%	21.36%	16.55%	23.65%	13.88%	19.99%
56 and thereafter	15.43%	22.05%	17.09%	24.41%	14.33%	20.64%
<i>COLA Loading:</i>		42.85%		42.88%		44.05%
<i>Interest:</i>	7.00%					
<i>Salary Increases:</i>	See Exhibit II, page 74					
<i>Mortality:</i>	See Exhibit II, page 75					

It is our understanding that in the determination of pension benefits under the CalPEPRA 2.7% at 57 formula, the compensation that can be taken into account for 2018 is equal to \$145,666 (reference: Section 7522.10). This amount should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2018 (reference: Section 7522.10(d)).

SECTION 4: Reporting Information for the Orange County Employees Retirement System

**Appendix C
Funded Percentages**

The funded percentages on a valuation value of assets basis by rate group provided for informational purposes only are as follows:

	Funded Percentage	
	December 31, 2017 Valuation	December 31, 2016 Valuation
General Members		
Rate Group #1 – Plans A, B and U (non-OCTA, non-OCSD)	80.19%	82.57%
Rate Group #2 – Plans I, J, O, P, S, T, U and W (County et al.)	70.12%	71.23%
Rate Group #3 – Plans B, G, H and U (OCSD)	100.00% ⁽¹⁾	100.42%
Rate Group #5 – Plans A, B and U (OCTA)	75.74%	77.31%
Rate Group #9 – Plans M, N and U (TCA)	74.76%	75.29%
Rate Group #10 – Plans I, J, M, N and U (OCFA)	76.08%	70.16%
Rate Group #11 – Plans M and N, future service, and U (Cemetery)	97.16%	103.37%
Rate Group #12 – Plans G, H, future service, and U (Law Library)	99.87%	84.42%
Safety Members		
Rate Group #6 – Plans E, F and V (Probation)	69.20%	70.84%
Rate Group #7 – Plans E, F, Q, R and V (Law Enforcement)	69.30%	69.89%
Rate Group #8 – Plans E, F, Q, R and V (OCFA)	79.03%	77.65%

⁽¹⁾ After transfer of \$24,042,000 from O.C. Sanitation District UAAL Deferred Account.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix D

Reconciliation of Employer Contribution Rates (by Rate Group)

The reconciliation of the employer contribution rates for the General Rate Groups #1 to #5 are as follows:

	Rate Group			
	RG #1 ⁽¹⁾	RG #2	RG #3	RG #5
1. Aggregate Recommended Contribution Rate as of December 31, 2016 (before adjustments to FY18-19 rates)	16.37% ⁽²⁾	33.36%	11.42%	25.47%
2. Adjustment to FY18-19 rates for additional UAAL contributions from Children and Families and Law Library	<u>0.00%</u>	<u>-0.02%</u>	<u>0.00%</u>	<u>0.00%</u>
3. Aggregate Recommended Contribution Rate as of December 31, 2016 (after adjustments to FY18-19 rates)	16.37% ⁽²⁾	33.34%	11.42%	25.47%
4. Actuarial (gain)/loss items:				
(a) Effect of investment gain (after smoothing)	-0.06%	-0.09%	N/A ⁽³⁾	-0.08%
(b) Effect of additional UAAL contributions from OCFA and anticipated payments from DOE and UCI	-0.31%	0.00%	N/A ⁽³⁾	0.00%
(c) Effect of actual contributions less/(more) than expected	-0.10%	0.16%	N/A ⁽³⁾	0.22%
(d) Effect of difference in actual versus expected COLA increases	-0.18%	-0.33%	N/A ⁽³⁾	-0.24%
(e) Effect of difference in actual versus expected salary increases	0.24%	-0.28%	N/A ⁽³⁾	-0.38%
(f) Effect of growth in total payroll (greater)/less than expected	0.21%	0.15%	N/A ⁽³⁾	0.71%
(g) Effect of other experience (gain)/loss ⁽⁴⁾	0.06%	0.11%	0.06%	-0.30%
(h) Effect of changes in actuarial assumptions ⁽⁵⁾	3.73%	4.65%	0.98% ⁽⁶⁾	4.88%
(i) Effect of three-year phase-in of UAAL cost impact due to changes in actuarial assumptions	<u>-1.69%</u>	<u>-2.38%</u>	<u>0.00%</u>	<u>-2.32%</u>
(j) Subtotal	1.90%	1.99%	1.04%	2.49%
5. Aggregate Recommended Contribution Rate as of December 31, 2017	18.27% ⁽⁷⁾	35.33%	12.46%	27.96%

⁽¹⁾ Liability associated with O.C. Vector Control has been excluded in determining rates for RG #1.

⁽²⁾ As of December 31, 2016, the net contribution rate for County and IHSS Public Authority after reflecting Board's UAAL contribution rate policy for U.C.I. and DOE is 13.30%.

⁽³⁾ N/A because RG #3 has paid off their UAAL after reflecting asset transfer from O.C. Sanitation District UAAL Deferred Account and under CalPEPRA, the employer's contribution rate cannot be less than the Normal Cost unless the funded ratio is over 120% and other conditions in CalPEPRA are met.

⁽⁴⁾ Net of an adjustment to reflect 18-month delay between date of valuation and date of rate implementation for all actuarial experience.

⁽⁵⁾ Actual effect of changes in actuarial assumptions on December 31, 2017 valuation is somewhat higher than the effect that we estimated in the experience study which was based on the December 31, 2016 valuation. This is primarily due to the effect of lower mortality rates based on the generational tables applied at two different measurement dates.

⁽⁶⁾ Includes the effect of \$24,042,000 asset transfer from O.C. Sanitation District UAAL Deferred Account to eliminate entire UAAL rate impact.

⁽⁷⁾ As of December 31, 2017, the net contribution rate for County and IHSS Public Authority after reflecting Board's UAAL contribution rate policy for Cypress Parks and Recreation, U.C.I. and DOE is 14.99% after adjustment for phase-in.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix D (Continued)

Reconciliation of Employer Contribution Rates (by Rate Group)

The reconciliation of the employer contribution rates for the General Rate Groups #9 to #12 are as follows:

	Rate Group			
	RG #9	RG #10	RG #11	RG #12
1. Aggregate Recommended Contribution Rate as of December 31, 2016 (before adjustments to FY18-19 rates)	23.53%	30.40%	10.81%	22.88%
2. Adjustment to FY18-19 rates for additional UAAL contributions from Children and Families and Law Library	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>-9.74%</u>
3. Aggregate Recommended Contribution Rate as of December 31, 2016 (after adjustments to FY18-19 rates)	23.53%	30.40%	10.81%	13.14%
4. Actuarial (gain)/loss items:				
(a) Effect of investment gain (after smoothing)	-0.06%	-0.08%	N/A ⁽¹⁾	N/A ⁽¹⁾
(b) Effect of additional UAAL contributions from OCFA and anticipated payments from DOE and UCI	0.00%	-3.92%	N/A ⁽¹⁾	N/A ⁽¹⁾
(c) Effect of actual contributions less/(more) than expected	-0.11%	-0.01%	N/A ⁽¹⁾	N/A ⁽¹⁾
(d) Effect of difference in actual versus expected COLA increases	-0.17%	-0.28%	N/A ⁽¹⁾	N/A ⁽¹⁾
(e) Effect of difference in actual versus expected salary increases	0.27%	-0.21%	N/A ⁽¹⁾	N/A ⁽¹⁾
(f) Effect of growth in total payroll (greater)/less than expected	-0.40%	0.73%	N/A ⁽¹⁾	N/A ⁽¹⁾
(g) Effect of other experience (gain)/loss ⁽²⁾	-0.03%	0.28%	0.11%	-0.10%
(h) Effect of changes in actuarial assumptions ⁽³⁾	2.73%	3.93%	2.52%	0.81%
(i) Effect of three-year phase-in of UAAL cost impact due to changes in actuarial assumptions	<u>-1.25%</u>	<u>-1.88%</u>	<u>-0.96%</u>	<u>0.00%</u>
(j) Subtotal	0.98%	-1.44%	1.67%	0.71%
5. Aggregate Recommended Contribution Rate as of December 31, 2017	24.51%	28.96%	12.48%	13.85%

⁽¹⁾ N/A because RG #11 and RG #12 have become overfunded and, under CalPEPRA and before reflecting the effect of changes in actuarial assumptions, the employer's contribution rate cannot be less than the Normal Cost unless the funded ratio is over 120% and other conditions in CalPEPRA are met.

⁽²⁾ Net of an adjustment to reflect 18-month delay between date of valuation and date of rate implementation for all actuarial experience.

⁽³⁾ Actual effect of changes in actuarial assumptions on December 31, 2017 valuation is somewhat higher than the effect that we estimated in the experience study which was based on the December 31, 2016 valuation. This is primarily due to the effect of lower mortality rates based on the generational tables applied at two different measurement dates.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix D (Continued)

Reconciliation of Employer Contribution Rates (by Rate Group)

The reconciliation of the employer contribution rates for the Safety rate groups are as follows:

	Rate Group		
	RG #6	RG #7	RG #8
1. Aggregate Recommended Contribution Rate as of December 31, 2016 (before adjustments to FY18-19 rates)	47.81%	62.39%	47.31%
2. Adjustment to FY18-19 rates for additional UAAL contributions from Children and Families and Law Library	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
3. Aggregate Recommended Contribution Rate as of December 31, 2016 (after adjustments to FY18-19 rates)	47.81%	62.39%	47.31%
4. Actuarial (gain)/loss items:			
(a) Effect of investment gain (after smoothing)	-0.11%	-0.14%	-0.13%
(b) Effect of additional UAAL contributions from OCFA and anticipated payments from DOE and UCI	0.00%	0.00%	-1.02%
(c) Effect of actual contributions less/(more) than expected	0.53%	0.18%	0.04%
(d) Effect of difference in actual versus expected COLA increases	-0.31%	-0.73%	-0.49%
(e) Effect of difference in actual versus expected salary increases	-0.71%	0.02%	-0.90%
(f) Effect of growth in total payroll (greater)/less than expected	1.29%	-1.58%	-0.06%
(g) Effect of other experience (gain)/loss ^{(1),(2)}	-0.26%	-0.76%	-0.24%
(h) Effect of changes in actuarial assumptions ^{(3),(4)}	8.34%	6.71%	4.02%
(i) Effect of three-year phase-in of UAAL cost impact due to changes in actuarial assumptions	<u>-4.26%</u>	<u>-3.71%</u>	<u>-2.29%</u>
(j) Subtotal	4.51%	-0.01%	-1.07%
5. Aggregate Recommended Contribution Rate as of December 31, 2017	52.32%	62.38%	46.24%

⁽¹⁾ Net of an adjustment to reflect 18-month delay between date of valuation and date of rate implementation for all actuarial experience.

⁽²⁾ Effect of other experience (gain)/loss for RG #7 includes: -0.33% due to changes in demographics and -0.31% adjustment due to 18-month delay.

⁽³⁾ Actual effect of changes in actuarial assumptions on December 31, 2017 valuation is somewhat higher than the effect that we estimated in the experience study which was based on the December 31, 2016 valuation. This is primarily due to the effect of lower mortality rates based on the generational tables applied at two different measurement dates.

⁽⁴⁾ Effect of changes in actuarial assumptions for RG #6 is greater than RGs #7 and #8 primarily due to the higher cashout assumption adopted for Rate Group #6 and lower cashout assumptions adopted for RGs #7 and #8. Also, for RG #8, we are no longer assuming 100% retirement after a member's benefit reaches 100% of Final Average Compensation.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix E Reconciliation of UAAL (by Rate Group)

The reconciliation of UAAL for the General rate groups are as follows:

	Rate Group (\$000s)							
	#1	#2	#3	#5	#9	#10	#11	#12
1. UAAL as of December 31, 2016	\$76,266	\$2,880,380 ⁽¹⁾	\$(2,522)	\$190,783	\$9,816	\$61,930	\$(289)	\$0 ⁽²⁾
2. Total normal cost at middle of year	14,763	245,192	15,119	20,896	1,534	6,232	276	304
3. Expected employer and member contributions	(20,796)	(476,386)	(15,119)	(36,263)	(2,318)	(11,157)	(276)	(416)
4. Interest	<u>5,080</u>	<u>200,947</u>	<u>(183)</u>	<u>13,295</u>	<u>675</u>	<u>4,277</u>	<u>(21)</u>	<u>(4)</u>
5. Expected UAAL as of December 31, 2017	\$75,313	\$2,850,133	\$(2,705)	\$188,711	\$9,707	\$61,282	\$(310)	\$(116)
6. Actuarial (gain)/loss and other changes:								
(a) (Gain) from additional UAAL contributions	\$(3,602)	\$0	\$0	\$0	\$0	\$(14,705)	\$0	\$0
(b) (Gain)/loss from actual contributions (more)/less than expected	(1,176)	24,567	(2)	3,137	(117)	(36)	(26)	(10)
(c) (Gain) from investment return	(669)	(13,215)	(1,107)	(1,195)	(57)	(302)	(17)	(17)
(d) (Gain) on lower than expected COLA increases	(2,168)	(50,225)	(2,859)	(3,465)	(170)	(1,043)	(23)	(29)
(e) (Gain)/loss from lower/higher than expected salary increases	2,805	(43,129)	1,667	(5,421)	274	(793)	134	(169)
(f) Other experience (gain)/loss	(1,137)	22,091	3,531	(3,004)	(187)	1,598	6	(84)
(g) (Gain) from asset transfer from O.C. Sanitation District UAAL Deferred Account	0	0	(24,042)	0	0	0	0	0
(h) Changes in actuarial assumptions	<u>26,577</u>	<u>481,098</u>	<u>25,517</u>	<u>43,481</u>	<u>1,665</u>	<u>9,159</u>	<u>517</u>	<u>438</u>
Total Changes	\$20,630	\$421,187	\$2,705	\$33,533	\$1,408	\$(6,122)	\$591	\$129
7. UAAL as of December 31, 2017	<u>\$95,943</u>	<u>\$3,271,320</u>	<u>\$0</u>	<u>\$222,244</u>	<u>\$11,115</u>	<u>\$55,160</u>	<u>\$281</u>	<u>\$13</u>

⁽¹⁾ After adjustment for additional UAAL contributions made by Children and Families Commission (i.e., Rate Group #2) of \$1.7 million to pay off their UAAL as of December 31, 2016 and adjustment of \$0.7 million for future service only benefit improvement for Children and Families Commission.

⁽²⁾ After adjustment for additional UAAL contributions made by Law Library (i.e., Rate Group #12) of \$1.5 million to pay off their UAAL as of December 31, 2016.

SECTION 4: Reporting Information for the Orange County Employees Retirement System

Appendix E (Continued)
Reconciliation of UAAL (by Rate Group)

The reconciliation of UAAL for the Safety rate groups are as follows:

	Rate Group (\$000s)		
	#6	#7	#8
1. UAAL as of December 31, 2016	\$213,650	\$1,058,165	\$338,504
2. Total normal cost at middle of year	24,266	90,016	49,927
3. Expected employer and member contributions	(41,240)	(173,845)	(77,058)
4. Interest	<u>14,982</u>	<u>73,863</u>	<u>23,431</u>
5. Expected UAAL as of December 31, 2017	\$211,658	\$1,048,199	\$334,804
6. Actuarial (gain)/loss and other changes:			
(a) (Gain) from additional UAAL contributions	\$0	\$0	\$(18,041)
(b) (Gain)/loss from actual contributions (more)/less than expected	4,735	5,864	790
(c) (Gain) from investment return	(987)	(4,593)	(2,242)
(d) (Gain) on lower than expected COLA increases	(2,771)	(24,422)	(8,621)
(e) (Gain)/loss from lower/higher than expected salary increases	(6,385)	560	(15,942)
(f) Other experience (gain)/loss	(1,158)	(5,331)	1,025
(g) (Gain) from asset transfer from O.C. Sanitation District UAAL Deferred Account	0	0	0
(h) Changes in actuarial assumptions	<u>50,030</u>	<u>161,417</u>	<u>53,637</u>
Total Changes	\$43,464	\$133,495	\$10,606
7. UAAL as of December 31, 2017	<u>\$255,122</u>	<u>\$1,181,694</u>	<u>\$345,410</u>

5531577v3/05794.002