

**ORANGE COUNTY EMPLOYEES  
RETIREMENT SYSTEM**

**Review of Economic Actuarial Assumptions  
for the December 31, 2004 Actuarial Valuation**



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## I. INTRODUCTION, SUMMARY, AND RECOMMENDATIONS

To project the cost and liabilities of the Pension Fund, assumptions are made about all future events that could affect the amount and timing of the benefits to be paid and the assets to be accumulated. Each year actual experience is compared against the projected experience, and to the extent there are differences, the future contribution requirement is adjusted.

If assumptions are changed, contribution requirements are adjusted to take into account a change in the projected experience in all future years. There is a great difference in both philosophy and cost impact between recognizing the actuarial deviations as they occur annually and changing the actuarial assumptions. Adjusting contributions as gains or losses occur without making a change in the assumptions is appropriate if the deviation from projections is considered temporary and if, over the long run, experience is expected to return to what was originally assumed. Changing assumptions reflects a basic change in thinking about the future, and it has a much greater effect on the current contribution requirements than the gain or loss for a single year.

The use of realistic actuarial assumptions is important to maintain adequate funding, while fulfilling benefit commitments to participants already retired and to those near retirement. The actuarial assumptions do not determine the “actual cost” of the plan. The actual cost is determined solely by the benefits and administrative expenses paid out, offset by investment income received. However, it is desirable to estimate as closely as possible what the actual cost will be so as to permit an orderly method for setting aside contributions today to provide benefits in the future, and to maintain equity among generations of participants and taxpayers.

This study was undertaken in order to review the economic actuarial assumptions. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27, “Selection of Economic Assumptions for Measuring Pension Obligations.” This Standard of Practice puts forth guidelines for the selection of the economic actuarial assumptions utilized in a pension plan actuarial valuation.

We are recommending no change in the economic assumptions currently used by the Board. Our recommendations for the economic actuarial assumptions for the December 31, 2004 Actuarial Valuation are as follows:

**Investment Return** - The estimated average net rate of return on assets over the projected lifetime of the System as of the valuation date. This rate is used to discount liabilities.

**Recommendation:** *Maintain the rate at 7.50% per annum.*

**Inflation** – Future increases in the cost-of-living index which drives investment returns and active member salary increases, as well as COLA increases to retired employees.

**Recommendation:** *Maintain the rate at 4.00% per annum.*

**Individual Salary Increases** - Increases in the salary of a member between the date of the valuation to the date of separation from active service. This assumption has three components:

- Inflationary salary increases.
- Real “Across the Board” salary increases.
- Promotional and merit increases.

**Recommendation:** *Maintain the current inflationary salary increase of 4.00%; real “across the board” salary increase of 0.00%; and promotional and merit increase of 0.50%.*

Section II provides some background on basic principles and the methodology used for the review of the economic actuarial assumptions. A detailed discussion of each of the economic assumptions and reasons behind the recommendations is found in Section III.

## II. BACKGROUND AND METHODOLOGY

In this report, we analyzed the “economic” assumptions only. The primary economic assumptions reviewed are inflation, investment return, and salary increases.

### *Economic Assumptions*

Economic assumptions consist of:

*Inflation* - Increases in the price of goods and services. The inflation assumption reflects the basic return that investors expect from securities markets. It also reflects the expected basic salary increase for active employees and drives increases in the allowances of retired members. Payments to the Unfunded Actuarial Accrued Liability (UAAL) are determined as a level dollar amount. This represents a decreasing percentage of future compensation, which will increase each year by the inflation rate plus any “across the board” pay increases that are assumed.

*Investment Return* – Expected return on the System’s investments. This assumption has a significant impact on contribution rates.

*Salary Increases* – In addition to inflationary increases, it is assumed that employees will receive raises from promotions and step increases. These are sometimes referred to as merit and longevity increases. Salaries will also grow by any real “across the board” pay increases that are assumed.

The setting of these assumptions is described in Section III.

### III. ECONOMIC ASSUMPTIONS

The investment return assumption is comprised of two components: (i) Inflation; and (ii) Real Rate of Return.

#### *Inflation*

Unless an investment grows at least as fast as prices increase, investors will experience a reduction in the inflation-adjusted value of their investment. There may be times when “riskless” investments return more or less than inflation, but over the long term, investment market forces will require an issuer of securities to maintain a minimum return which protects investors from inflation.

The inflation assumption is long term in nature, so it is set using primarily historical information. Following is an analysis of 15 and 30 year moving averages of historical inflation rates:

<b>Historical Consumer Price Index – 1931 to 2003</b>			
<b>(U.S. City Average - All Urban Consumers)</b>			
	<u>25<sup>th</sup> Percentile</u>	<u>Median</u>	<u>75<sup>th</sup> Percentile</u>
15 year moving averages	2.9%	3.8%	5.2%
30 year moving averages	3.2%	4.3%	5.0%

The average of the 30 year and 15 year moving average medians is 4.05%.

OCERS’s investment consultant, Callan Associates, Inc. (CAI), anticipates an annual inflation rate of 2.6%. We recognize that inflation has remained low (compared to historical averages) over the last 20 years or so; however, we are inclined to rely more heavily upon historical averages when projecting inflation over the long-term future.

**Based on this analysis, we recommend that the current 4.00% annual inflation assumption be continued for the December 31, 2004 valuation.**

#### *Real Rate of Investment Return*

This component represents the portfolio’s incremental investment market returns over inflation. Theory has it that, as an investor takes a greater investment risk, the return on the investment is expected to also be greater, as least in the long run. This additional return is expected to vary by asset class and empirical data supports that expectation. For that reason, the real rate of return

assumptions are developed by asset class. Therefore, the real rate of return assumption for a retirement system's portfolio will vary with the Board's asset allocation among asset classes.

Following is the System's target asset allocation as of June 30, 2004 and the assumed real rate of return assumptions by asset class. The column of returns represents the average of a broader sample of real rate of return assumptions. The sample includes the expected annual real rate of returns provided to us by CAI and by five other investment advisory firms retained by Segal's 1937 Act clients. We believe these assumptions reasonably reflect long term future market returns.

**OCERA Target Asset Allocation as of December 31, 2004 and Assumed Real Rate of Return Assumptions by Asset Class and for the Portfolio**

Asset Class	Percentage of Portfolio*	Average Real Rate of Return from a Sample of Consultants to Segal's 1937 Act Clients' **
Broad Domestic Equity	20%	6.70%
Developed International Equity	20%	7.14%
Emerging Market Equity	5%	10.45%
Core Bonds (including TIPS)	30%	2.42%
Global Bonds	10%	2.76%
Real Estate	10%	4.81%
Alternative Investment	5%	9.40%
<b>Total Portfolio</b>	<b>100%</b>	<b>5.24%</b>

\* As instructed by OCERS, we have not changed the asset allocation to reflect a 5% allocation to the Global Tactical Asset Allocation Account.

\*\* Including Orange, San Bernardino, Alameda, Contra Costa, San Diego and Ventura.

Please note that the comparable real rate of return calculated by using the assumed return from CAI alone is 4.77% (nominal return of 7.37% minus CAI's inflation rate of 2.6%).

Please note that the above are representative of "indexed" returns and do not include any additional returns ("alpha") from active management.

The following are some observations about the returns provided above:

1. The investment return assumptions utilized by CAI are lower than the average assumptions (including CAI) used by the investment consultants to Segal's 1937 Act clients in the sample.
2. Using an average of expected real rate of returns allows the System's investment return assumption to include a broader range of capital market information and should help reduce year to year volatility in the System's investment return assumption.
3. Therefore, we recommend that the 5.24% portfolio real rate of return be used to determine the System's investment return assumption.

***System Expenses***

The real rate of return assumption for the portfolio needs to be adjusted for administrative and investment expenses to be paid from investment income.

The following table provides the available history of these expenses in relation to the actuarial value of assets.

**Administrative and Investment Expenses as a Percentage of Actuarial Value of Assets  
(All dollars in 000's)**

FYE	Actuarial Value of Assets*	Administrative Expenses	Investment Expenses**	Administrative %	Investment %	Total %
1999	\$3,504,708	\$6,094	\$15,890	0.17%	0.45%	0.62%
2000	3,931,744	6,631	20,556	0.17	0.52	0.69
2001	4,497,362	7,146	18,929	0.16	0.42	0.58
2002	4,586,844	8,279	18,266	0.18	0.40	0.58
2003	4,695,675	8,848	16,769	0.19	0.36	0.55
					Average	0.60%

\* As of beginning of plan year.

\*\* Net of securities lending expenses

Based on this experience, we believe a future expense assumption of 0.60% is reasonable.



### ***Risk Adjustment***

The real rate of return assumption for the portfolio needs to be adjusted to reflect the potential risk of shortfalls in the return assumptions. The System's asset allocation also determines this portfolio risk, since risk levels also are expected to vary by asset class. This portfolio risk is incorporated into the real rate of return assumption through a risk adjustment.

Last year, the Board adopted an investment return assumption of 7.50%. Based on this current 7.50% investment return assumption and the inflation, real return and expense components discussed above, we calculate that there is an implied risk adjustment of approximately 1.14%. Using the annual portfolio standard deviation of 10.67% provided by CAI, this is equivalent to about a 66% confidence level that the actual average return over 15 years would not fall below the assumed return, assuming that the distribution of returns over that period follows the Normal statistical distribution<sup>1</sup>. Please note that the average confidence level used by Segal's other 1937 Act clients in setting their return assumption is 65%. We believe a 66% confidence level is appropriate in setting the investment assumption for OCERS.

### ***Recommended Investment Return Assumption***

The following table provides the calculated investment return assumption that results from the previous discussion.

<b>Calculation of Investment Return Assumption</b>	
<b>Assumption Component</b>	<b>Recommended Value</b>
Inflation	4.00%
Plus Portfolio Real Rate of Return	5.24%
Minus Expense Adjustment	(0.60%)
Minus Risk Adjustment	<u>(1.14%)</u>
Total	7.50%

**Based on this analysis, we recommend that the investment return assumption be maintained at 7.50%.**

<sup>1</sup> The theory that long term investment returns follow a Normal distribution is debatable; however, we believe the Normal distribution assumption is not unreasonable for purposes of setting the risk adjustment.

### ***Salary Increase Assumption***

Salary increases impact plan costs in two ways: (i) by increasing members' benefits (since benefits are a function of the members' highest average pay) and future normal cost collections; and (ii) by increasing total active member payroll which in turn generates higher UAAL amortization payments (or greater rate credit demands if the UAAL is negative). These two impacts are discussed separately below.

As an employee progresses through his or her career, increases in pay are expected to come from three sources:

1. Inflation – Unless pay grows at least as fast as consumer prices grow, employees will experience a reduction in their standard of living. There may be times when pay increases lag or exceed inflation, but over the long term, labor market forces will require an employer to maintain its employees' standards of living.

**As discussed earlier in this report, we are recommending an inflation rate of 4.00%.**

2. Real "Across the Board" Pay Increases – These increases are typically termed productivity increases since they are considered to be derived from an organization's ability to produce goods and services in a more efficient manner. As that occurs, some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all employees "across the board." The State and Local Government Workers Employment Cost Index produced by the Department of Labor provides evidence that real "across the board" pay increases have averaged about 0.7% - 1.0% annually during the last 10 - 20 years. However, this has generally been a period of low inflation and favorable investment markets, so there remains some question as to whether this will sustain in the long term.

**We recommend that the real "across the board" assumption of 0% be continued in this valuation. This assumption will be reviewed in more detail at the next experience study.**

3. Promotional and Merit Increases – As the name implies, these increases come from an employee's career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For OCERS, there is a flat promotional and merit increase of 0.5% annually. The assumption at some other public retirement systems is typically structured as a

function of an employee's age and/or service, and it is derived from employee-specific information as part of the triennial experience study.

**We recommend maintaining the same promotional and merit assumptions of 0.5% per annum in this valuation. This assumption will be reviewed in more detail at the next experience study.**

4. All three of these forces are incorporated into a salary increase assumption that is applied in the actuarial valuation to project future benefits and future normal cost contribution collections. These assumptions are as follows:

**Total Salary Increase Assumptions**  
**(Inflation plus Real "Across the Board" plus Merit and Longevity)**

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Inflation:	4.0%
Real "Across the Board Increase":	0.0%
Promotional and Merit Increase:	<u>0.5%</u>
Total	4.5%

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