

# Orange County Employees Retirement System

## The Evolution of OCERS Unfunded Actuarial Accrued Liability

Steve Delaney, CEO  
December 31, 2008 Valuation

# The Evolution of OCERS Unfunded Actuarial Accrued Liability

The Orange County Employees Retirement System (OCERS) is a public pension plan providing a defined benefit life-time pension to many of Orange County's diverse community of public servants - from firefighters and police officers to bus drivers and court clerks.

OCERS conducts an annual valuation of the plan Trust Fund to determine its current economic status. In the most recent valuation, for the period ending December 31, 2008, the system's professional actuary (The Segal Group) calculated the Unfunded Actuarial Accrued Liability (UAAL) of the fund stood at approximately \$3.1 billion. As recently as December 31, 2000 there was no UAAL at all, the system being more than 100% funded as of that date. The drivers and components that contributed to the evolution of OCERS' current UAAL are the subjects of this paper.

## WHAT IS AN UAAL?

The Government Accounting Standards Board (GASB) officially defines UAAL as "the difference between the actuarial accrued liability and the actuarial value of assets accumulated to finance" a public pension. In simpler terms, if you compare the cost of OCERS pension promises with the actuarial value of OCERS assets, the promises currently exceed the assets. That shortfall is OCERS' Unfunded Actuarial Accrued Liability.

A fully funded pension system with no UAAL (as was the case for OCERS in 2000), generally means that all of the actuary's assumptions about the cost of the fund and growth of liabilities have been met, and the present value of the system's accumulated assets are sufficient to pay out the pension promises to plan members.

But how does a public pension plan accrue the necessary funds for paying out benefits, and how can that process lead to a gap between the amount of assets held, and the present value of those future benefits?

A pension system's approach to building its assets in order to pay future benefits is not unlike the approach taken by many families in saving for their children's college education. If you expect your child's education is going to cost \$100,000 eighteen years from now, you have three basic options:

- (1) You could deposit a single lump sum amount representing the present value of that future cost into a savings account, similar to an endowment or trust, calculated to grow with sufficient earnings to total \$100,000 when the child is ready for his or her first day of college.
- (2) You could save over time, depositing an equal amount year after year into an account and again assume that sufficient interest earnings will accrue to fully fund the cost when the big day arrives.
- (3) You could wait until the child turns 18 and pull from your available resources at that time to pay the entire \$100,000 in a single payment.

Public pension plans face similar choices in determining the best method for accruing sufficient resources to fund a member's benefit at retirement. Like most American families, the majority of public pension plan systems choose to pay a level percent of salary each year, in order to gradually grow the amount needed to fund future retirements.

Determining how much to contribute each year is a primary challenge for any public pension system. For that reason public pension plans will use the expertise of a professional actuary to assist in planning the funding of those retirement benefits over the long term, allowing investment earnings on the contributions to fund the majority of the pension costs. In Orange County those investment earnings provide the largest portion of retirement benefits being paid, greatly reducing the cost to Orange County's employees and taxpayers in providing public services to our community.

The job of a pension plan actuary includes calculating how much money should be contributed each year so the plan will have enough funds to pay the benefits promised by the plan. The year-to-year stream of contributions should be as smooth and consistent as possible to avoid wreaking havoc on the budget of the employer.

Unfortunately those assumptions cannot always predict what the future will actually bring, and that in turn can develop an UAAL.

## HOW DID OCERS' CURRENT UAAL DEVELOP?

The long-term cost of retiree benefits are based on a host of variables, the future values of which are unknown. There are many different events that can both cause a UAAL to develop or even disappear. While actuaries try to pin down these variables through the use of best or at least reasonable assumptions and professional methodologies, the unexpected should be expected to occur.

There are six assumptions in particular that have the greatest impact on the actuary's estimates of plan funding:

1. The assumed rate of return on investments
2. The rate of increase in salaries
3. Member mortality
4. The age at which members choose to retire
5. How many members become disabled
6. How many members terminate their service earlier than anticipated

Finally, there are two other events that can have great impact on plan funding, events the actuaries can't anticipate:

- (1) plan changes, that is, when a benefit formula is changed in some unanticipated manner, and
  - (2) assumption changes, that is, when actual experience indicates that previous assumptions must be modified.
- Either will generally have an "unfunded" impact on the cost of the system, though savings can occur as well.

All of the events above come into play in this review of the evolution of OCERS' UAAL over the past decade.

First, a quick summary history of OCERS UAAL as well as the plan's funded status over the past quarter century or more:

(In 000's)

Actuarial Valuation Date December 31	Actuarial Value of Plan Assets	Total Unfunded Actuarial Accrued Liability (UAAL)	Funded Ratio
1985	\$613,863	\$462,121	57.05%
1986	\$713,506	\$507,409	58.44%
1987	\$821,884	\$522,098	61.16%
1988	\$985,030	\$468,828	67.75%
1989	\$1,136,210	\$515,778	68.78%
1990	\$1,297,575	\$543,340	70.49%
1991	\$1,576,131	\$196,763	88.84%
1992	\$1,807,319	\$332,763	84.45%
1993	\$2,024,447	\$280,572	87.83%
1994	\$2,177,673	\$372,386	85.40%
1995	\$2,434,406	\$199,478	92.43%
1996	\$2,675,632	\$176,262	93.82%
1997	\$3,128,132	\$204,835	93.85%
1998	\$3,504,708	\$177,978	95.17%
1999	\$3,931,744	\$85,535	97.87%
2000	\$4,497,362	(\$162,337)	103.74%
2001	\$4,586,844	\$257,055	94.69%
2002	\$4,695,675	\$978,079	82.76%
2003	\$4,790,099	\$1,309,334	78.53%
2004	\$5,245,821	\$2,158,151	70.85%
2005	\$5,786,617	\$2,303,010	71.53%
2006	\$6,466,085	\$2,298,960	73.77%
2007	\$7,288,900	\$2,549,786	74.08%
2008	\$7,748,380	\$3,112,335	71.34%

As shown in the table above, the annual calculation of OCERS' UAAL can swing dramatically from year to year, such as **1990-91** when the UAAL shrank from \$543 million to \$196 million, a reduction of nearly 40% in a single year due primarily to the remarkable earnings of that year (1991: 20.25%); or **2002-03** when the UAAL grew from \$978 million to \$1.3 billion, an increase of approximately 30% reflecting both assumption and benefit changes the year before, as well as the delayed recognition of some heavy investment losses incurred in the three prior years

### **YEAR BY YEAR REVIEW:**

It is current history that has raised the most questions from both employers, members and the public in wanting to better understand how the current UAAL has evolved over the past decade. In the following pages the data used in calculating the UAAL from calendar year 2000 when OCERS last had a surplus, through 2008, is presented in table format, with commentary on the events of each year that had primary impact on determining if the UAAL rose or fell for that given year.

[See the following annual reviews for the OCERS UAAL as it develops from the year 2000 through 2008.]

### **CONCLUSION:**

As this review has shown, both experience and assumptions often change, and have a major impact on the system's future costs. Actuaries use long economic cycles to make their assumptions. They do not often adjust their assumptions in response to year-to-year fluctuations in actual experience. Rather, actuarial assumptions are typically changed only following careful assessment of ongoing and durable trends in experience. Because public pension plans such as OCERS take a very long view of the time horizon, recognizing that our average member retires with 22 years of service, OCERS is designed specifically to allow time to exercise its smoothing effect on the costs associated with the variability of life and its vagaries.

The UAAL is only an estimate based on many different inputs and assumptions that are all subject to change. The UAAL is not an absolute number such as the fixed amount of your home mortgage, but is rather a fluid estimate that will both rise and fall as it is revised annually based upon actual experience. Under a well structured plan with conservative assumptions, the deviations tend to be both positive (as was the case in 2006) and negative (such as in 2008) over time. The causes of transitory shortfalls and surpluses will be captured in improved assumptions and appropriate contribution rates over time, ensuring a secure financial foundation for the promises made to Orange County's public servants.

**Development of UAAL/(Surplus) for Year Ended December 31, 2000**

1.	<b>UAAL at beginning of year</b>		\$ 85,534,716
2.	Total normal cost at middle of year		
3.	Amortization Payment		(6,752,601)
4.	Interest		<u>11,403,640</u>
5.	Expected UAAL		\$ 90,185,755
6.	Actuarial (gain)/loss and other changes		
	a. Gain on investment	\$(286,267,436)	
	b. Loss on salary increases	24,584,670	
	c. Loss on new retirees	29,186,796	
	d. Gain on mortality	(28,835,682)	
	e. Other experience loss	8,809,049	
	f. Benefit improvements		
	g. Change in actuarial assumptions		
	h. Total changes		<u>(252,522,603)</u>
7.	<b>(Surplus) at the end of the year</b>		\$ (162,336,848)

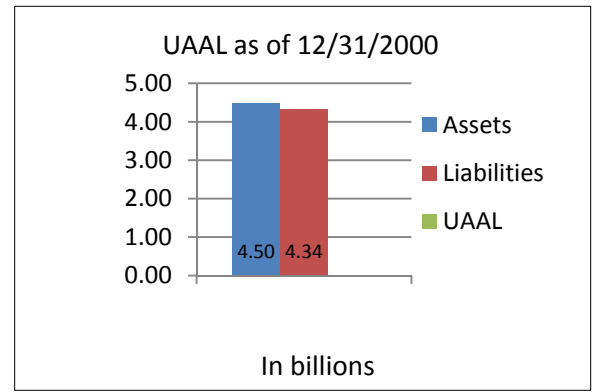
**IMPACTING EVENTS**

Calendar year 2000 is a key year, and emblematic of how public pension systems are designed to smooth out the highs and lows of plan costs over time, OCERS moves from a UAAL of \$85 million at the start of the year to a surplus of \$162 million as the year comes to a close.

There were no significant changes in Plan provisions in calendar year 2000.

Though total fund returns for 2000 were only 3.28% that exceeded the policy benchmark and ranked OCERS in the top quartile of the Callan Public Plan Sponsor Database. Altogether the recognition of past and current smoothed earnings lowered the UAAL by over \$286 million.

The actuarial value of assets passed the actuarial value of liabilities in 2000, and the Plan was 103.7% funded at the end of the calendar year.



**Development of UAAL/(Surplus) for Year Ended December 31, 2001**

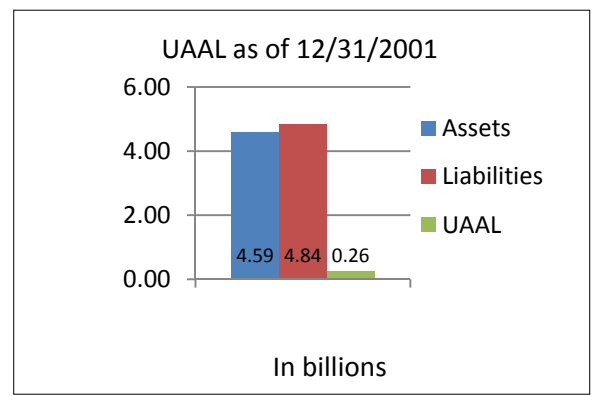
1.	<b>(Surplus) at beginning of year</b>		\$ (162,336,848)
2.	Total normal cost at middle of year		
3.	Amortization Payment		(11,193,795)
4.	Interest		<u>7,117,033</u>
5.	Expected UAAL		\$ (158,260,086)
6.	Actuarial (gain)/loss and other changes		
	a. Loss on investment	\$221,191,812	
	b. Loss on salary increases	40,447,786	
	c. Loss on new retirees	48,490,180	
	d. Other experience loss	19,791,339	
	e. Change in actuarial assumptions	(34,094,126)	
	f. Impact of 3% @ 50 for Law Enforcement (Safety)	119,488,767	
	g. Total changes		<u>415,315,758</u>
7.	<b>UAAL at the end of the year</b>		\$ 257,055,672

**IMPACTING EVENTS**

While not significant, changes to the assumed withdrawal rates, the assumed termination rates, the assumed service-connected disability rates and the assumed retirement rates taken together actually lowered future liabilities by approximately \$34 million.

The change in the retirement benefit for Law Enforcement (safety) members to a 3% per year of service benefit payable at age 50 increased future liability by approximately \$119 million.

The OCERS portfolio experienced a loss of -3.24% in calendar year 2001, with an earnings assumption of 8%. That loss, though smoothed led to an increase of the UAAL by \$221 million.



**Development of UAAL for Year Ended December 31, 2002**

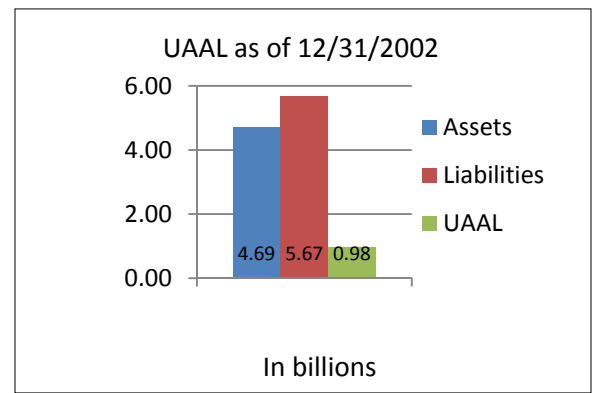
1.	<b>UAAL at beginning of year</b>		\$ 257,055,672
2.	Total normal cost at middle of year		
3.	Amortization Payment		12,123,329
4.	Interest		<u>27,502,107</u>
5.	Expected UAAL		\$ 296,681,108
6.	Actuarial (gain)/loss and other changes		
	a. Loss on investment	\$ 220,329,452	
	b. Loss on salary increases	91,886,000	
	c. Loss on new retirees	82,392,000	
	d. Other experience loss	48,763,0690	
	e. Change in actuarial assumptions	148,339,453	
	f. Impact of 3% @50 for Firefighters; Probation become Safety	89,688,449	
	g. Total changes		<u>681,398,423</u>
7.	<b>UAAL at the end of the year</b>		\$ 978,079,531

**IMPACTING EVENTS**

OCERS experienced negative returns in 2002 as did much of the market. A loss of -5.46%, when the assumption was for earnings of 8% led to an effective hit of -13.46% on the funding position of the plan. Even with smoothing in place, more than \$220 million in losses were applied to the UAAL.

With the market having been down for a couple of years in a row, the OCERS Board revisited its earnings assumption and lowered the portfolio’s assumed rate of return from 8% annual to 7.5%. That change in earnings assumption indicated there would be lower investment earnings to offset plan costs. Taken together with a lowering of the assumption for future salary increases (when salaries don’t grow as fast as anticipated, fewer contributions than anticipated will be flowing to the system) from 5.5% to 4.5% annually, led to a \$148 million increase in the UAAL.

On the benefit side, the retirement benefit formula for firefighters was improved to 3% of final average salary at age 50. Additionally Probation Officers became Safety Members, providing them with improved benefits as well. Those benefit changes added \$89 million to the UAAL.



**Development of UAAL for Year Ended December 31, 2003**

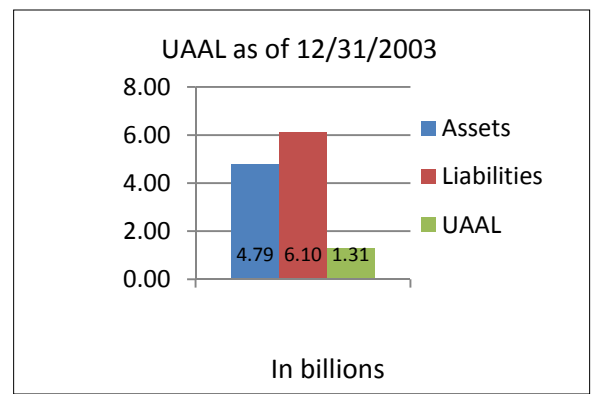
1.	<b>UAAL at beginning of year</b>		\$ 978,079,531
3.	Total normal cost at middle of year		
4.	Amortization Payment		(58,355,527)
5.	Interest (7.5%)		<u>78,359,367</u>
6.	Expected UAAL		\$ 998,083,371
7.	Actuarial (gain)/loss and other changes		
	a. Loss on investment	\$ 287,828,001	
	b. Gain on salary increases	(103,234,000)	
	c. Loss on new retirees	119,420,000	
	d. Other experience loss	4,898,374	
	e. Change in actuarial assumptions		
	f. Impact of new formula for City of San Juan Capistrano, and City of Rancho Santa Margarita	2,337,899	
	g. Total changes		<u>311,250,274</u>
8.	<b>UAAL at the end of the year</b>		\$1,309,333,645

**IMPACTING EVENTS**

Despite a great year for the market, with the OCERS portfolio returning 19.84% in 2003, that wasn't enough to offset the smoothed losses of prior years continuing to be recognized in the valuation, with the UAAL growing by over \$287 million on that basis alone.

Even with the lower salary growth assumption adopted in the previous year, member salaries did not grow as fast as anticipated, so while fewer contributions came in, that was offset by lower growth in pension liabilities, leading to a reduction in the UAAL of \$103 million.

The cities of San Juan Capistrano and Rancho Santa Margarita adopted improved benefit formulas for their general service members, 2.7% @55 for San Juan Capistrano, and 2.5% @55 for Rancho Santa Margarita.



**Development of UAAL for Year Ended December 31, 2004**

1.	<b>UAAL at beginning of year</b>		\$1,309,334,000
2.	Changes in methods and procedures		106,630,000
3.	Total normal cost at middle of year		188,163,000
4.	Actual employer/member contributions		(279,940,000)
5.	Interest		102,756,000
6.	Expected UAAL		\$1,426,943,000
7.	Actuarial (gain)/loss and other changes		
	a. Gain on investment	\$(50,536,000)	
	b. Other experience loss	19,372,000	
	c. Benefit improvements	365,409,000	
	d. Change in actuarial assumptions	579,681,000	
	e. Change to 3.5% inflation assumption and Entry Age Normal funding method	33,129,000	
	f. Change in investment return	(215,487,000)	
	g. Total changes		731,208,000
8.	<b>UAAL at the end of the year</b>		\$2,158,151,000

**IMPACTING EVENTS**

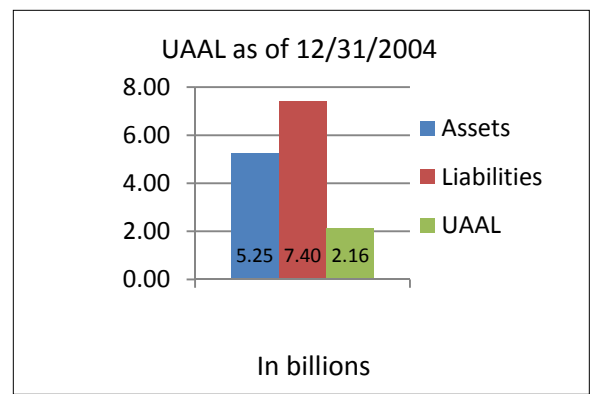
Two major events occurred in 2004, a change in actuarial services from Towers Perrin to The Segal Group led to a review and change in actuarial methods, procedures, and assumptions. There were also several retirement benefit formula improvements

Moving from one actuary to another is an uncommon event The change in valuation methods and procedures between Towers Perrin and The Segal Group led to an increase in the UAAL of \$107 million. 2004 is the only year you will find the “Changes in Methods and Procedures” line entry capturing the impact of that change in this document.

In addition to reflecting a change in methods and procedures, the 2004 valuation also includes a number of basic actuarial assumption changes regarding future salary increases, rates of withdrawal at termination, and rates of retirement. Those changes added an additional \$580 million to the UAAL.

An improvement in benefits as Probation members adopted the 3% @50 formula, Orange County Transportation Authority adopted 2.5% @55, and The County of Orange general members adopted 2.7% @55, increased the UAAL by \$365 million.

A gain for the fund was the recognition that the current portfolio composition would earn an assumed rate of return of 7.75%, an increase over the previous 7.5%. That assumption that greater earnings would assist in offsetting costs lowered the UAAL by \$215 million.



## Development of UAAL for Year Ended December 31, 2005

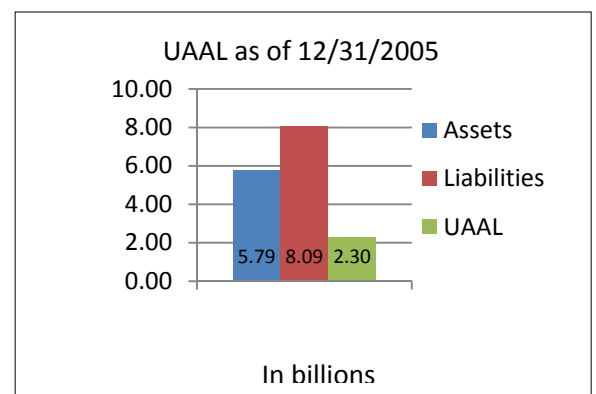
1.	<b>UAAL at beginning of year</b>		\$2,158,151,000
2.	Total normal cost at middle of year		297,420,000
3.	Actual employer/member contributions		(345,111,000)
4.	Interest		<u>165,409,000</u>
5.	Expected UAAL		\$2,275,869,000
6.	Actuarial (gain)/loss and other changes		
	a. Gain on investment	\$ (39,536,000)	
	b. Loss on salary increases	16,544,000	
	c. Change in methodology used to calculate benefits for deferred vested members	(15,335,000)	
	d. Other experience loss	65,468,000	
	e. Benefit improvements		
	f. Change in actuarial assumptions		
	g. Total changes		<u>27,141,000</u>
7.	<b>UAAL at the end of the year</b>		\$2,303,010,000

### IMPACTING EVENTS

2005 is an example of how over the long term a defined benefit plan experiencing a period of rising costs can correct itself and move to a more stable norm. Though the UAAL rose just over \$27 million in 2005, that was smaller as a percentage than the positive rise in the overall size of the portfolio, causing the funded status of the plan to improve from 70.85% at the start of the year, to 71.53% by the end of the year.

A positive return on the OCERS portfolio of 8.83%, exceeding the assumed earnings rate of 7.75%, allowed for application of a portion (after smoothing) of those investment gains to offset some larger losses where the economic and demographic experience through 2005 was negatively different from the actuarial assumptions.

A change in actuarial methodology used in calculating benefits for deferred vested members with reciprocal service led to a reduction in the UAAL of \$15 million.



## Development of UAAL for Year Ended December 31, 2006

1.	<b>UAAL at beginning of year</b>		\$2,303,010,000
2.	Total normal cost at middle of year		300,072,000
3.	Actual employer/member contributions		(425,950,000)
4.	Interest		<u>173,606,000</u>
5.	Expected UAAL		\$2,350,738,000
6.	Actuarial (gain)/loss and other changes		
	a. Gain on investment	\$(112,612,000)	
	b. Loss on salary increases	21,679,000	
	c. Other experience loss	39,155,000	
	d. Benefit improvements		
	e. Change in actuarial assumptions		
	f. Total changes		<u>(51,778,000)</u>
7.	<b>UAAL at the end of the year</b>		\$2,298,960,000

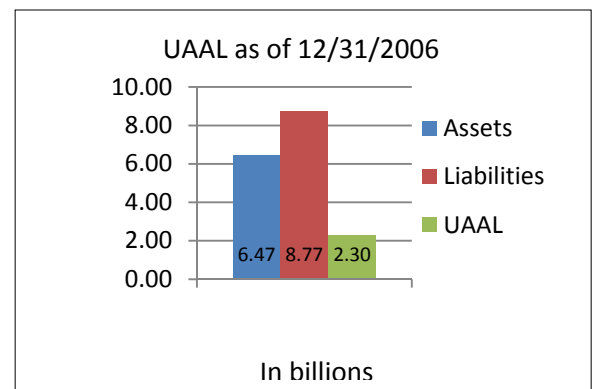
### IMPACTING EVENTS

2006 is another example, like that of 2005, of how over the long term a defined benefit plan can correct itself and move to a more stable norm. In 2006 the UAAL dropped in relatively modest terms, by approximately \$5 million. Overall however the funded status of the plan again improved, moving from 71.53% at the start of the year, to 73.77% by the end of the year. At the same time the aggregate employer contribution rate (the average of the County of Orange and all special districts combined) decreased from 24.27% of payroll to 24.01%. In turn, the aggregate employee's contribution rate similarly decreased from 10.39% of payroll to 10.36%.

Much of the positive movement in 2006 can be attributed to the 13.55% positive portfolio returns, exceeding the assumed earnings rate of 7.75%, allowing for application of a portion (after smoothing) of those investment gains towards the existing UAAL.

There were no benefit plan changes or any actuarial assumption changes in 2006.

The City of Rancho Santa Margarita did withdraw from OCERS in 2006 in order to move to CalPERS. There were no retirees with service earned with the City of Rancho Santa Margarita, so no long term pension liabilities were left behind with the OCERS plan upon the City's departure.



## Development of UAAL for Year Ended December 31, 2007

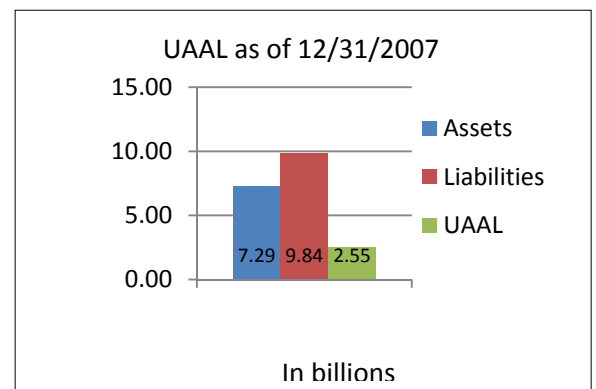
1.	<b>UAAL at beginning of year</b>		\$2,298,960,000
2.	Total normal cost at middle of year		324,706,000
3.	Actual employer/member contributions		(486,212,000)
4.	Interest		<u>171,911,000</u>
5.	Expected UAAL		\$2,309,365,000
6.	Actuarial (gain)/loss and other changes		
	a. Gain on investment	\$(176,681,000)	
	b. Loss on salary increases	136,417,000	
	c. Other experience loss	43,538,000	
	d. Benefit improvements		
	e. Change in actuarial assumptions	237,147,000	
	f. Total changes		<u>240,421,000</u>
7.	<b>UAAL at the end of the year</b>		\$2,549,786,000

### IMPACTING EVENTS

2007 saw a positive return on the OCERS portfolio of 10.75%, exceeding the assumed earnings rate of 7.75%, allowing for application of a portion (after smoothing) of those investment gains to offset some large changes in the actuarial assumptions.

Coming out of a triennial Actuarial Experience Study, analyzing the period of January 1, 2005 through December 31, 2007, a number of actuarial assumptions were changed in the areas of mortality, termination of membership, rates of retirement, salary growth, and annual payoffs, leading to an increase in the UAAL of approximately \$237 million.

A benefit change for the Cemetery District, moving to a 2% of final average salary at age 55 for future service only, was too negligible to have an impact on plan funding.



## Development of UAAL for Year Ended December 31, 2008

1.	<b>UAAL at beginning of year</b>		\$2,549,786,000
2.	Changes in methods and procedures		
3.	Total normal cost at middle of year		361,097,000
4.	Actual employer/member contributions		(532,656,000)
5.	Interest		190,961,000
6.	Expected UAAL		\$2,569,188,000
7.	Actuarial (gain)/loss and other changes		
	a. Loss on investment	\$257,752,000	
	b. Loss on salary increases	97,561,000	
	c. Loss on new retirements	54,911,000	
	d. Other experience loss	17,159,000	
	e. Benefit improvements		
	f. Change in actuarial assumptions	115,764,000	
	g. Total changes		543,147,000
8.	<b>UAAL at the end of the year</b>		\$3,112,335,000

### IMPACTING EVENTS

2008 saw massive losses in the market by public pension systems across the country, with the Dow Jones Industrial Average (DJIA) down by -33.8%, the worst single year decline since the Great Depression. OCERS did remarkably well, declining by only -20.71%. Yet, even with smoothing of gains and losses in place, that decline led to a loss of \$257.7 million that had to be recognized in the calculation of the 2008 UAAL.

Changes in service retirement rates for General members under improved benefit formulas required a change in actuarial assumptions, leading to an increase in the UAAL of \$115.7 million.

