



**CITY OF PASADENA  
MISCELLANEOUS & SAFETY PLANS**

**CalPERS Actuarial Issues – 6/30/08 Valuation**

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ASSOCIATES, LLC

March 15, 2010

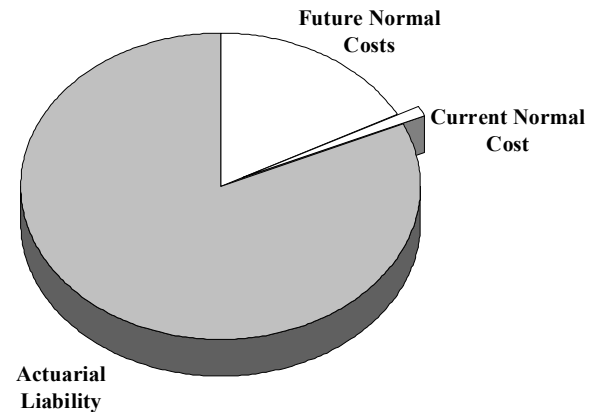
## AGENDA

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Demographic Information		47	57
3% @ 55 – Amendment 6/30/2001		55	-
2.5% @ 55 – Amendment 6/30/2001		-	65



# Definitions

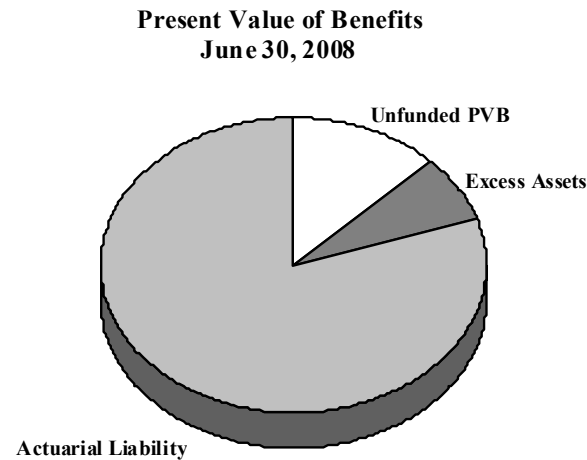
Present Value of Benefits  
June 30, 2008



- **PVB - Present Value of all Projected Benefits:**
  - Discounted value (at valuation date - 6/30/08), of all future expected benefit payments based on various (actuarial) assumptions
- **Actuarial Liability:**
  - Discounted value (at valuation date) of benefits earned through valuation date [value of past service benefit]
  - Portion of PVB “earned” at measurement
- **Current Normal Cost:**
  - Portion of PVB allocated to (or “earned” during) current year
  - Value of employee and employer current service benefit



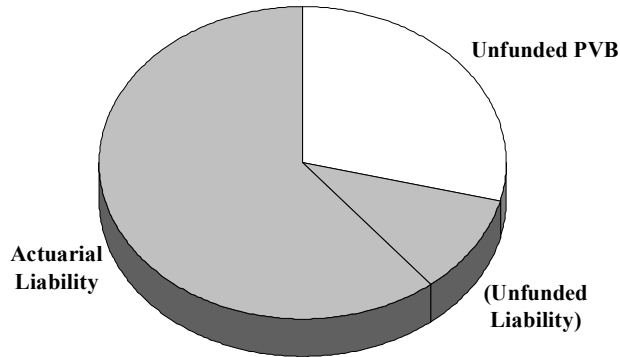
# Definitions



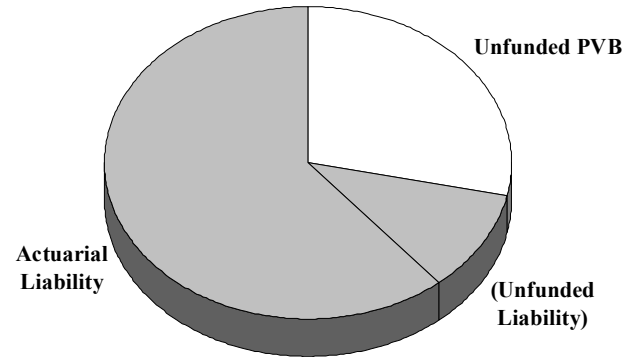
- **Target-** Have money in the bank to cover Actuarial Liability (past service)
- **Unfunded Liability** - Money short of target at valuation date
- **Excess Assets / Surplus:**
  - Money over and above target at that point in time.
  - Doesn't mean you're done contributing.
- **Super Funded:**
  - Assets cover whole pie (PVB)
  - If everything goes exactly like PERS calculated, you'll never have to put another (employer or employee) dime in.

# Plan Funded Status Safety

**Present Value of Benefits  
June 30, 2007**



**Present Value of Benefits  
June 30, 2008**



**June 30, 2007**

\$	135,200,000
	(47,800,000)
	285,800,000
	373,200,000

**Unfunded PVB  
(Unfunded Liability)  
Actuarial Liability  
PVB**

**June 30, 2008**

\$	146,400,000
	(54,300,000)
	317,100,000
	409,200,000

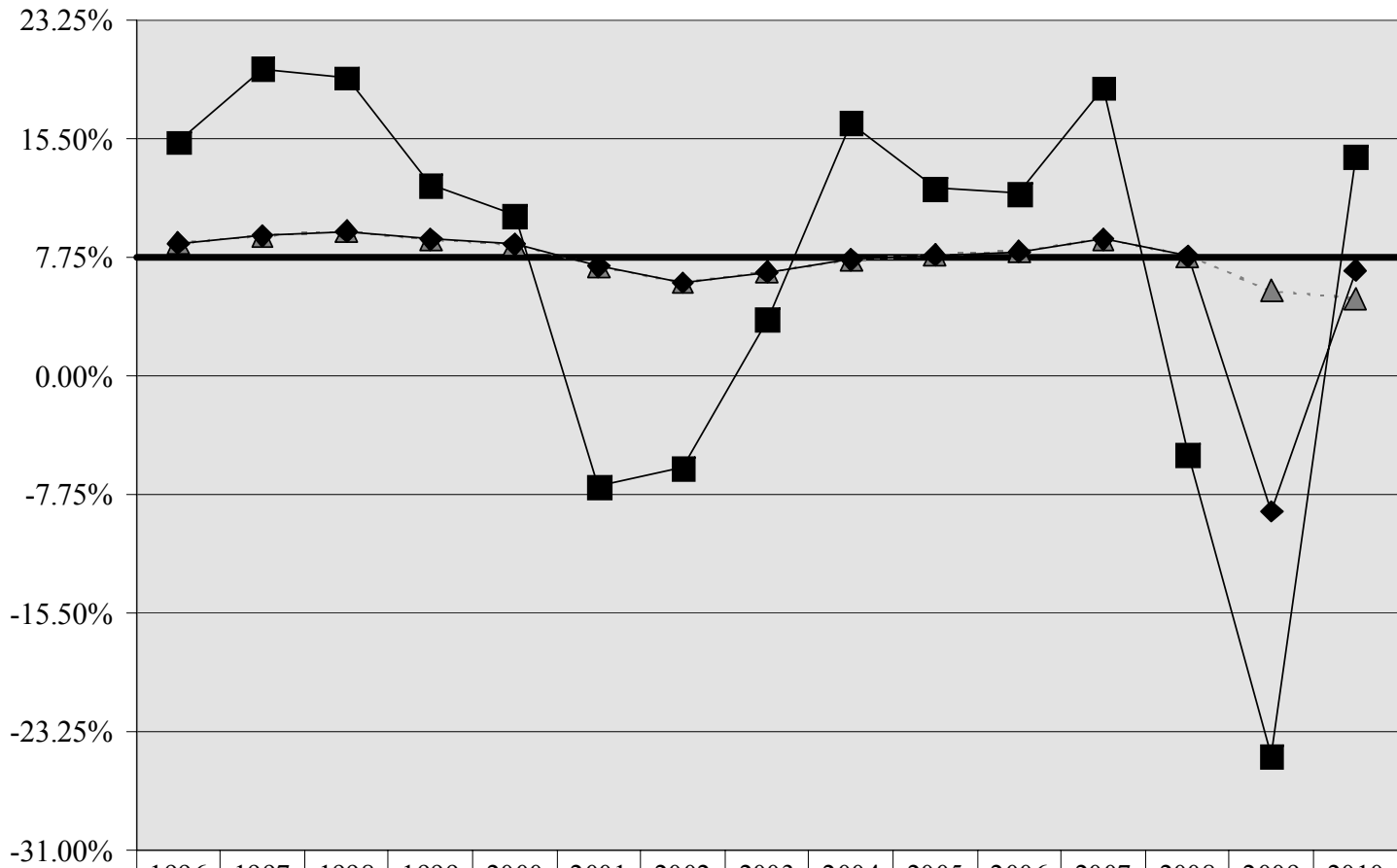


## Plan Funded Status Safety

- What happened between 6/30/07 and 6/30/08?
  - Asset gain/(loss):  $\approx 0.1$  million
  - Actuarial gain/(loss):  $\approx (6.1)$  million
    - Average Salary \$99,400  $\rightarrow$  \$105,600
    - Number of Actives 404  $\rightarrow$  407
    - Number of Inactives 117  $\rightarrow$  119
    - Number of Retirees 161  $\rightarrow$  176
  - Contribution gain/(loss):  $\approx 0.4$  million
    - Expected  $\approx (13.4)$
    - Actual  $\approx 13.8$
  - Expected UAL Decrease/(Increase):  $\approx (0.6)$  million
  - 1951 Survivor Benefit Level 4  $\approx (0.4)$  million



# Actuarial Investment Return Safety



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
--▲-- AVA Modified	8.7%	9.2%	9.5%	9.0%	8.6%	7.2%	6.1%	6.8%	7.6%	7.9%	8.2%	9.0%	7.9%	5.6%	5.1%
—■— MVA Rate	15.3%	20.1%	19.5%	12.5%	10.5%	-7.2%	-6.0%	3.7%	16.6%	12.3%	11.9%	18.8%	-5.1%	-24.8	14.4%
—◆— AVA Unmodified	8.7%	9.2%	9.5%	9.0%	8.6%	7.2%	6.1%	6.8%	7.6%	7.9%	8.2%	9.0%	7.9%	-8.8%	6.9%



## Actuarial Investment Return Safety

Above assumes contributions, payments, etc. received evenly throughout year.

- 6/30/08:
  - Market Value return  $\approx (5.1)\%$
  - Actuarial Value return  $\approx 0.1 \%$
- 6/30/09:
  - Market Value return  $\approx (24.8)\%<sup>1</sup>$
  - Actuarial Value return
    - Modified  $\approx 5.6 \%$
    - Unmodified  $\approx (8.8)\%$
- 6/30/10:
  - Market Value return through 12/31/09  $\approx 12.6 \%$
  - Estimated Annualized MVA Return<sup>2</sup>  $\approx 14.4 \%$
  - Est. Annualized Modified AVA Return  $\approx 5.1 \%$

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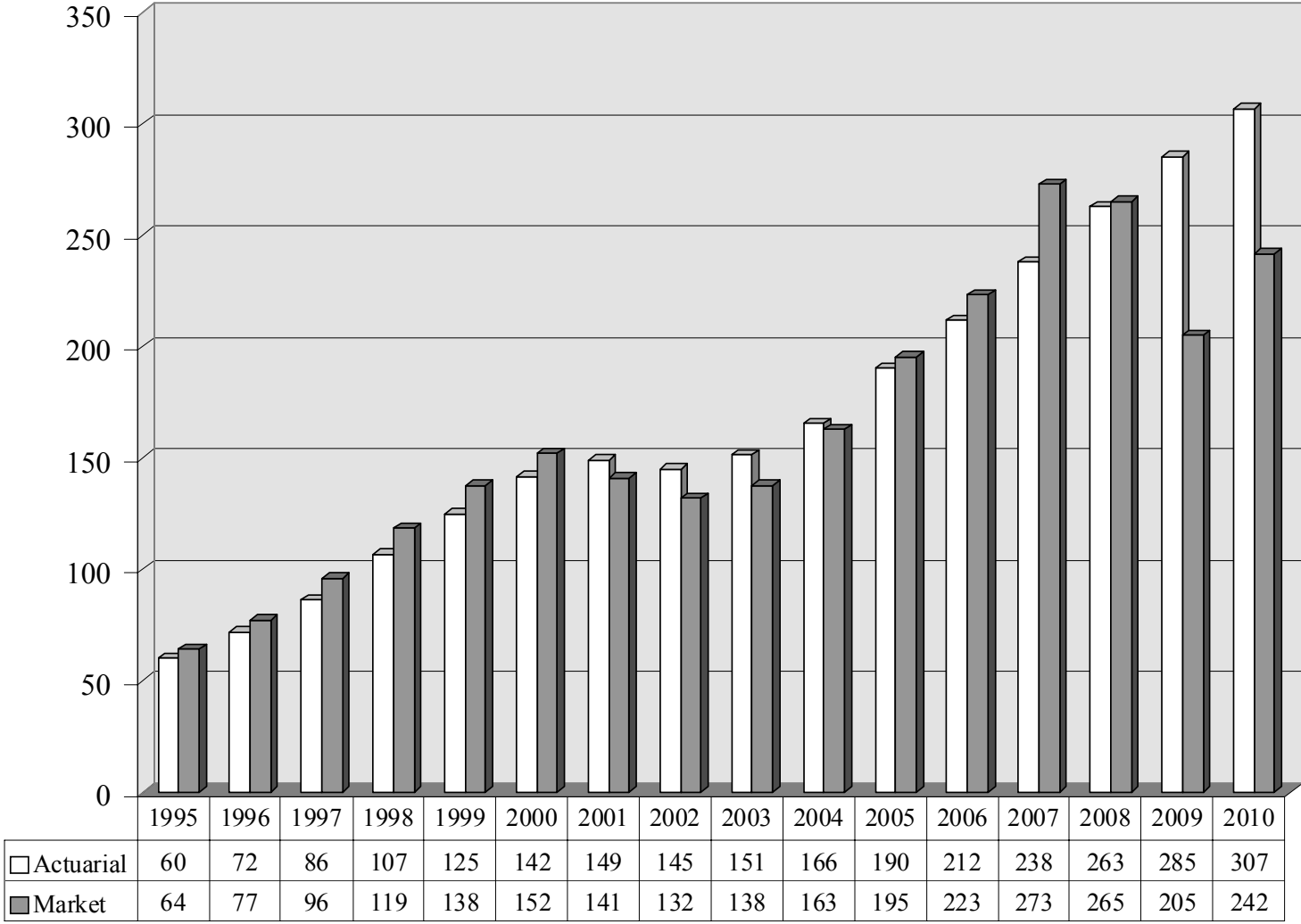
<sup>1</sup> Estimated based on CalPERS 6/30/09 published rate of return or -23.5%, adjusted by published 6/30/09 values for real estates and AIM.

<sup>2</sup> Estimate based on CalPERS 12/31/09 published rate of return of 12.6%, a loss of 1.5% through 1/31/10 based on CalPERS market value from the website and 7.75% thereafter.





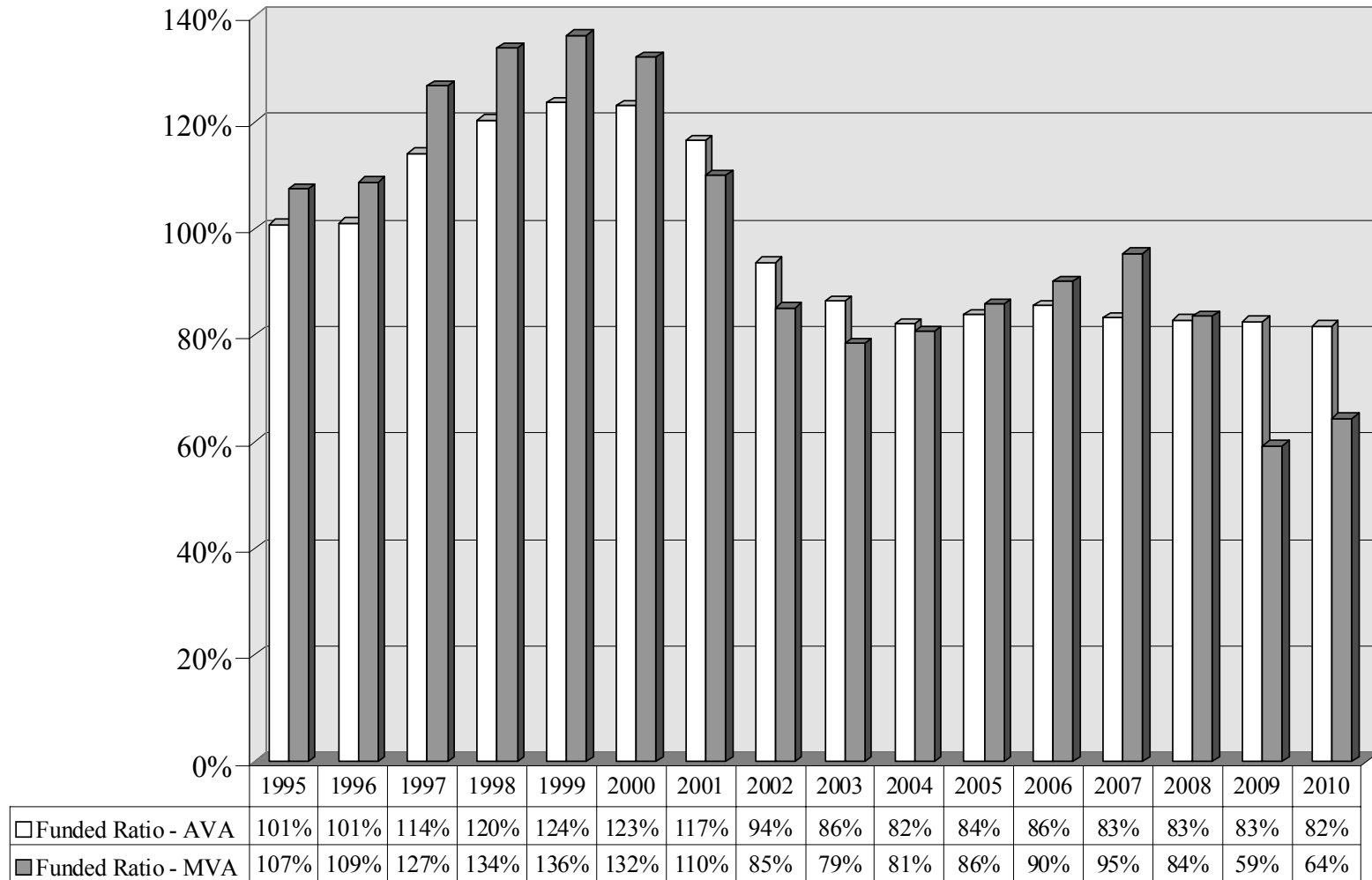
# Asset Values (Millions) Safety



6/30/09 & 6/30/10 asset values estimated



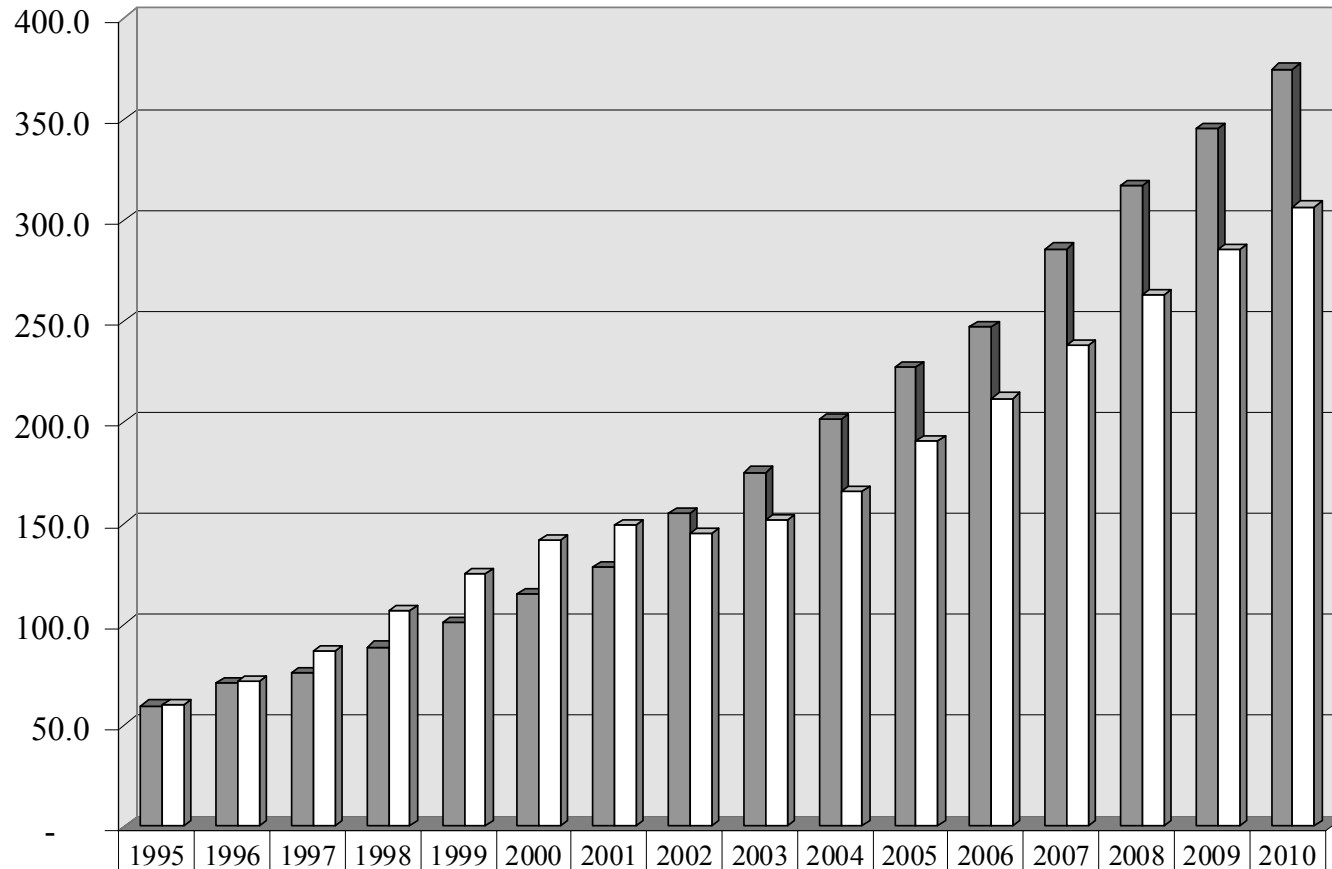
# Funded Status Safety



6/30/09 & 6/30/10 funded status estimated



## Funded Status (Millions) Safety



■ Actuarial Liability	59.7	71.0	75.7	88.6	101.0	115.0	128.0	154.8	175.2	201.5	227.2	247.2	285.8	317.1	345.1	374.9
□ Actuarial Asset Value	60.2	71.8	86.4	106.8	125.0	141.5	149.2	145.0	151.5	165.6	190.4	211.8	238.0	262.8	285.1	306.6

6/30/09 & 6/30/10 asset values estimated



## Funded Status Safety

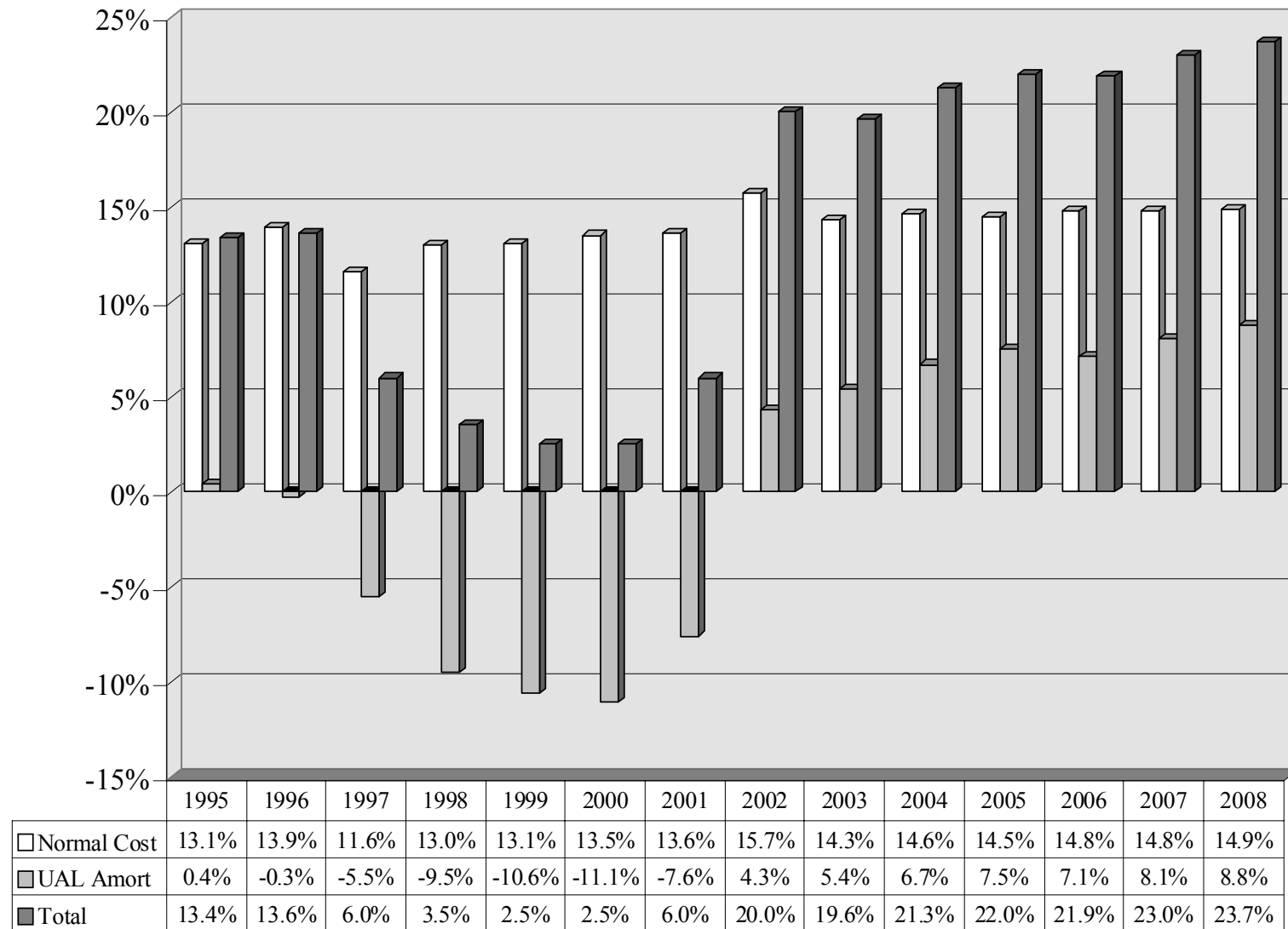
- Investment gains/(losses) – Impact on funded status:
  - Actuarial asset “reserve” at 6/30/08 0.8%
  - 6/30/09 [-24.8% compared to 7.75%] -32.6%
  - 6/30/10 [14.4% compared to 7.75%] 6.6%
  - Total estimated % loss through 6/30/10 -25.1%
  - Total estimated unrecognized gain \$ -66.6 million  
[ -25.1% x \$ 265 ]

			Projected	
	6/30/07	6/30/08	6/30/10	6/30/40
■ UAL <sup>3</sup> (millions)	\$ 47.8	\$ 54.3	\$55.8	\$53.5
■ Investment losses 08/09 <sup>4</sup>			84.2	109.5
■ Investment gains 09/10 <sup>4</sup>			<u>-17.6</u>	<u>-22.9</u>
■ Total			<b>122.4</b>	<b>140.1</b>

<sup>3</sup> Does not include asset gains or losses after June 30, 2008.

<sup>4</sup> Ignores future gains & losses (after 6/30/09) and asset smoothing, and assumes continuance of 30-year rolling amortization method.

# Contribution Rates Safety



## Contribution Rates Safety

	<u>6/30/07</u> <u>2009/2010</u>	<u>6/30/08</u> <u>2010/2011</u>
■ Normal cost	14.8%	14.9%
■ Amortization bases:		
● Initial UAL	-0.3%	-0.2%
● (Gain)/Loss	3.9%	4.5%
● Benefit Changes	7.2%	7.0%
● Assumption Changes	-2.4%	-2.3%
● Method Changes	<u>-0.2%</u>	<u>-0.2%</u>
Sub-total	<u>8.1%</u>	<u>8.8%</u>
● <b>Total:</b>	<b>23.0%</b>	<b>23.7%</b>
● Amortization period	Multiple ≈21 years	Multiple ≈21 years
■ What Happened from 6/30/07 to 6/30/08:		
● 2009/10 Rate	23.0%	
● (Gains)/Losses	0.6	
● Benefit Changes	<u>0.1</u>	
● 2010/11 Rate	23.7%	

## Contribution Projections Safety

■ Market Value Investment Return:

- June 30, 2009 -24.8%<sup>5</sup>
- Estimated June 30, 2010 14.4%<sup>6</sup>
- June 30, 2011 - 2014 75% Confidence Limit<sup>7</sup>:  $\approx$  **0.4% - 3.6%**
- 50% Confidence Limit:  $\approx$  **7.75%**
- 25% Confidence Limit:  $\approx$  **11.8% - 15.3%**

■ Fresh Starts:

● **No Fresh Starts for 10/11**

- 15 Year 2.1% 20 Year 0.2% 25 Year -0.9%

■ No Other:

- Gains or Losses
- Method or Assumption Changes
- Benefit Improvements

■ Estimated \$84.2 million market value loss:

- Results in 6.1% 2011/12 contribution rate increase ( $\approx$  \$ 3.1 million)
- 30 year amortization would be 10.0% rate increase ( $\approx$  \$ 5.1 million)

<sup>5</sup> Estimated based on CalPERS 6/30/09 published rate of return or -23.5%, adjusted by published 6/30/09 values for real estates and AIM.

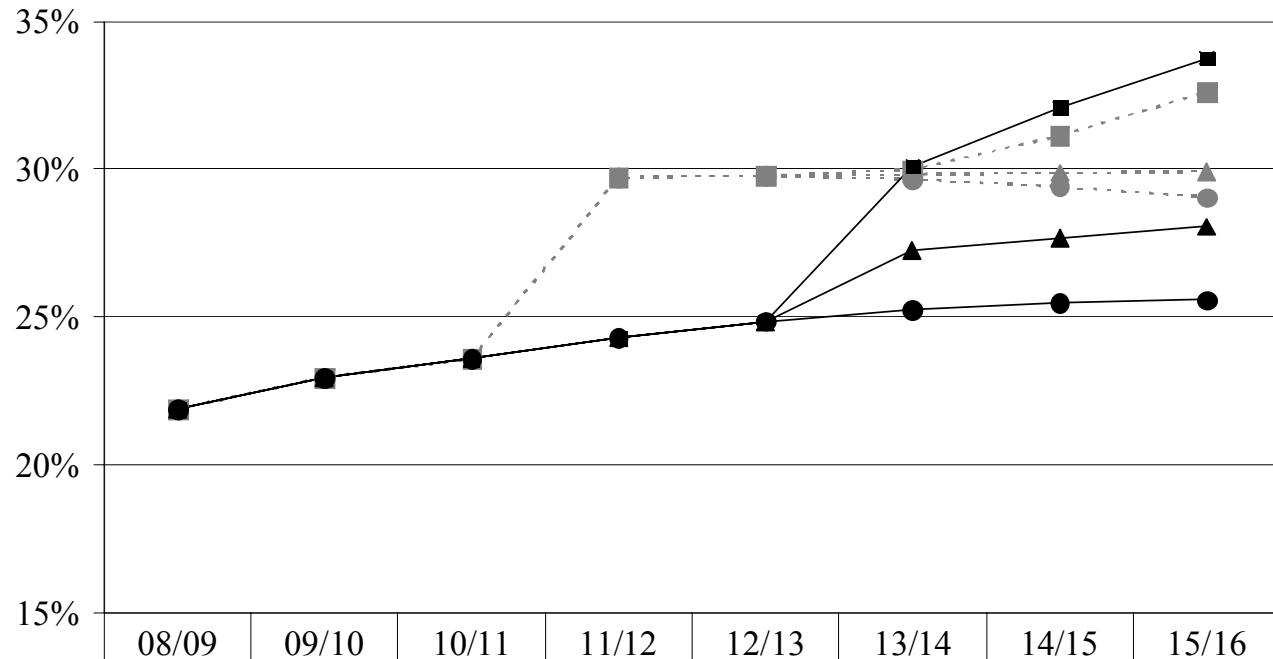
<sup>6</sup> Estimate based on CalPERS 12/31/09 published rate of return of 12.6%, a loss of 1.5% through 1/31/10 based on CalPERS market value from the website and 7.75% thereafter.

<sup>7</sup> Confidence Limits – Actual Return will exceed the given rate with indicated probabilities, rates vary by year.



# Contribution Projections Safety

**Investment Return Varies  
and No Fresh Start 10/11**



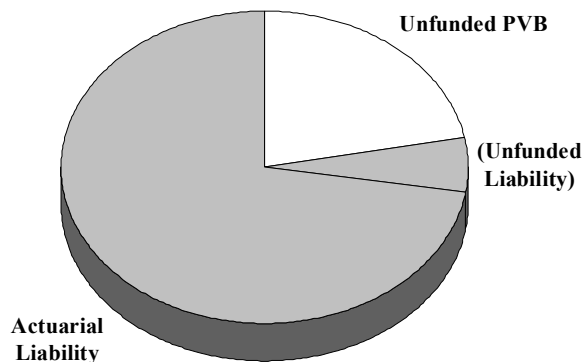
	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
---■--- Unmodified AVA - 75th	21.9%	23.0%	23.6%	29.7%	29.8%	30.0%	31.1%	32.6%
---▲--- Unmodified AVA - 50th	21.9%	23.0%	23.6%	29.7%	29.8%	29.8%	29.9%	29.9%
---●--- Unmodified AVA - 25th	21.9%	23.0%	23.6%	29.7%	29.8%	29.7%	29.4%	29.0%
—■— Modified AVA - 75th	21.9%	23.0%	23.6%	24.3%	24.9%	30.1%	32.1%	33.8%
—▲— Modified AVA - 50th	21.9%	23.0%	23.6%	24.3%	24.9%	27.3%	27.7%	28.1%
—●— Modified AVA - 25th	21.9%	23.0%	23.6%	24.3%	24.9%	25.3%	25.5%	25.6%



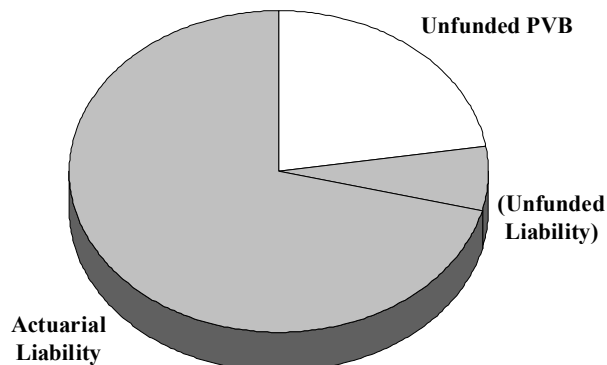


## Plan Funded Status Miscellaneous

**Present Value of Benefits  
June 30, 2007**



**Present Value of Benefits  
June 30, 2008**



**June 30, 2007**

\$	177,500,000
	(46,200,000)
	585,900,000
	717,200,000

**Unfunded PVB  
(Unfunded Liability)  
Actuarial Liability  
PVB**

**June 30, 2008**

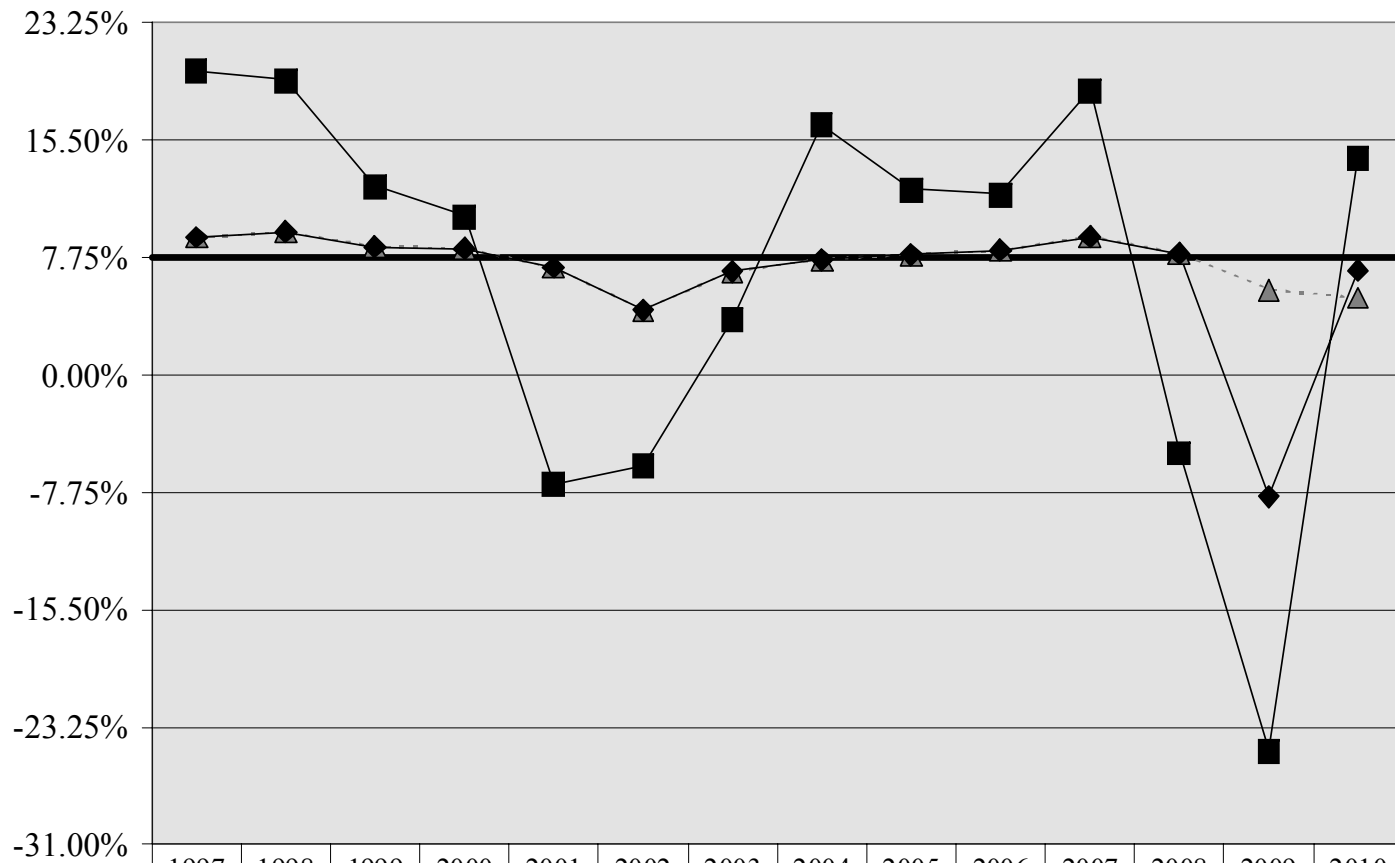
\$	201,900,000
	(59,000,000)
	638,100,000
	781,000,000



## Plan Funded Status Miscellaneous

- What happened between 6/30/07 and 6/30/08?
  - Asset gain/(loss):  $\approx 0.8$  million
  - Actuarial gain/(loss):  $\approx (16.7)$  million
    - Average Salary \$66,700  $\rightarrow$  \$70,900
    - Number of Actives 1,531  $\rightarrow$  1,569
    - Number of Inactives 820  $\rightarrow$  825
    - Number of Retirees 1,277  $\rightarrow$  1,302
  - Contribution gain/(loss):  $\approx 2.5$  million
    - Expected  $\approx (20.9)$
    - Actual  $\approx 23.4$
  - Expected UAL Decrease/(Increase):  $\approx 0.5$  million

# Actuarial Investment Return Miscellaneous



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
--▲-- AVA Modified	9.1%	9.4%	8.5%	8.4%	7.1%	4.3%	6.8%	7.6%	8.0%	8.2%	9.1%	8.0%	5.6%	5.1%
—■— MVA Rate	20.1%	19.5%	12.5%	10.5%	-7.2%	-6.0%	3.7%	16.6%	12.3%	11.9%	18.8%	-5.1%	-24.8%	14.4%
—◆— AVA Unmodified	9.1%	9.4%	8.5%	8.4%	7.1%	4.3%	6.8%	7.6%	8.0%	8.2%	9.1%	8.0%	-8.0%	6.9%



## Actuarial Investment Return Miscellaneous

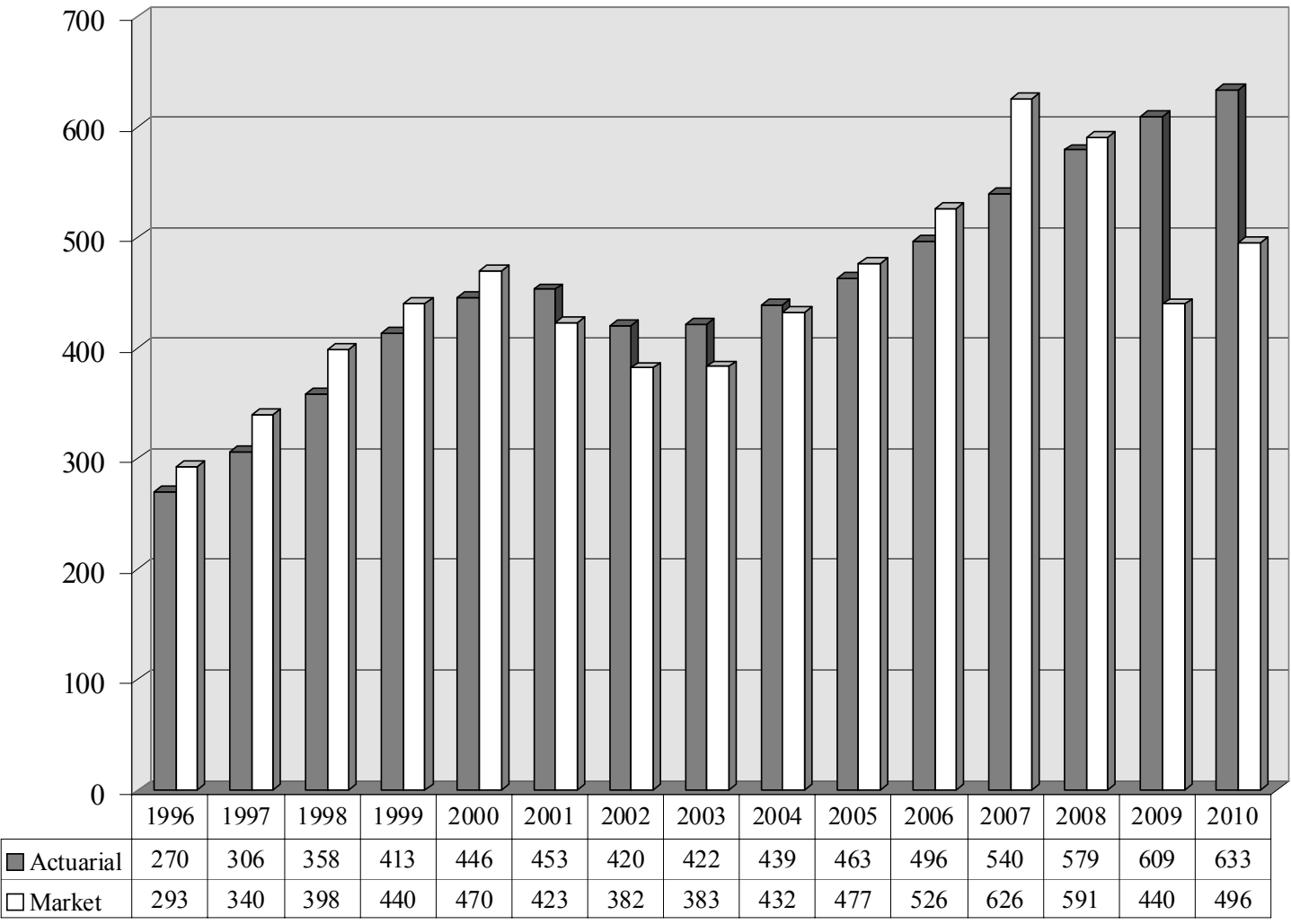
- Above assumes contributions, payments, etc. received evenly throughout year.
- 6/30/08:
  - Market Value return  $\approx (5.1)\%$
  - Actuarial Value return  $\approx 0.1 \%$
- 6/30/09:
  - Market Value return  $\approx (24.8)\%<sup>8</sup>$
  - Actuarial Value return
    - Modified  $\approx 5.6 \%$
    - Unmodified  $\approx (8.0)\%$
- 6/30/10:
  - Market Value return through 12/31/09  $\approx 12.6 \%$
  - Estimated Annualized MVA Return<sup>9</sup>  $\approx 14.4\%<sup>0</sup>\%$
  - Est. Annualized Modified AVA Return  $\approx 5.1 \%$

<sup>8</sup> Estimated based on CalPERS 6/30/09 published rate of return or -23.5%, adjusted by published 6/30/09 values for real estates and AIM.

<sup>9</sup> Estimate based on CalPERS 12/31/09 published rate of return of 12.6%, a loss of 1.5% through 1/31/10 based on CalPERS market value from the website and 7.75% thereafter.

# Asset Values (Millions)

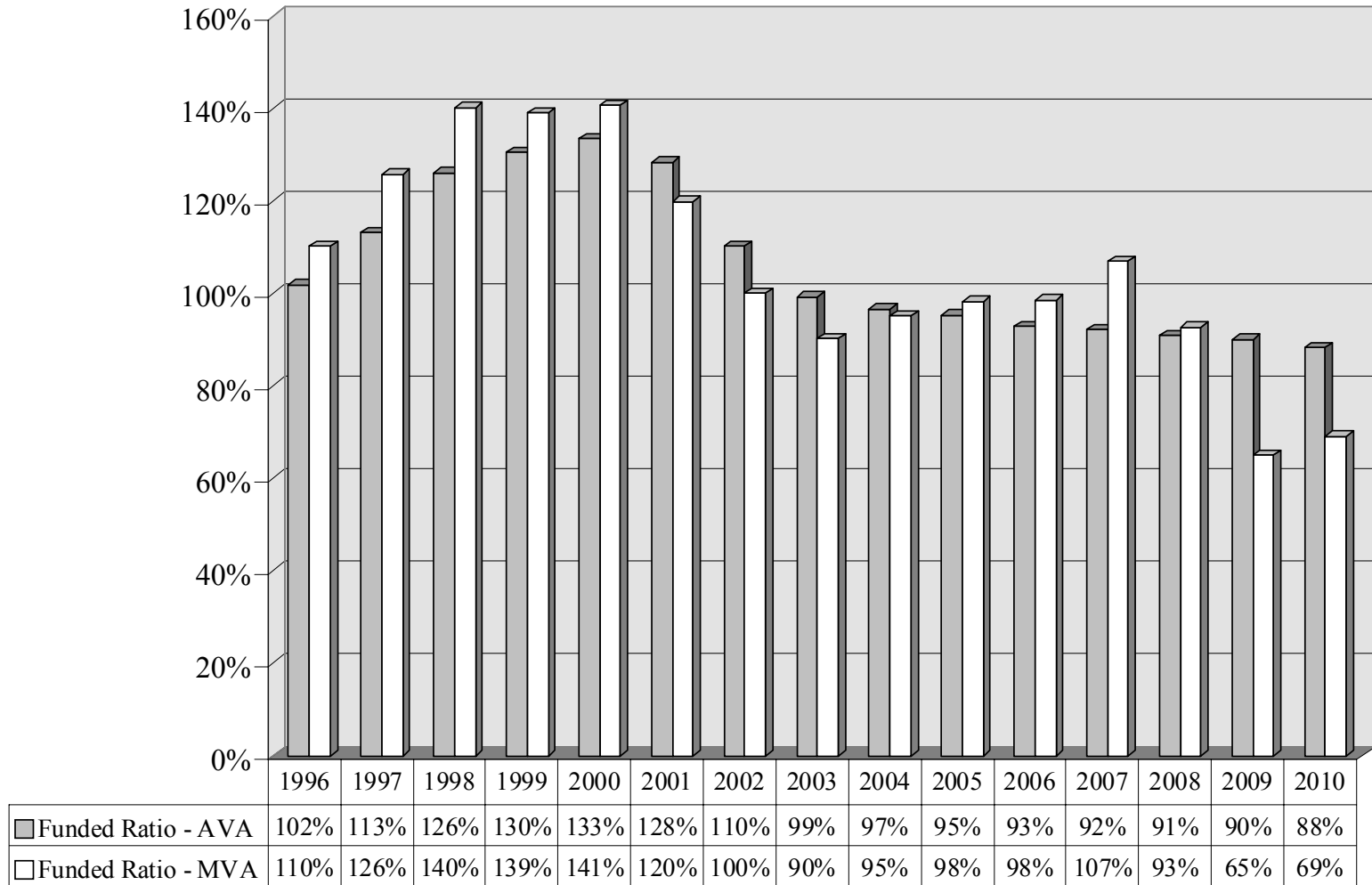
## Miscellaneous



6/30/09 & 6/30/10 asset values estimated.



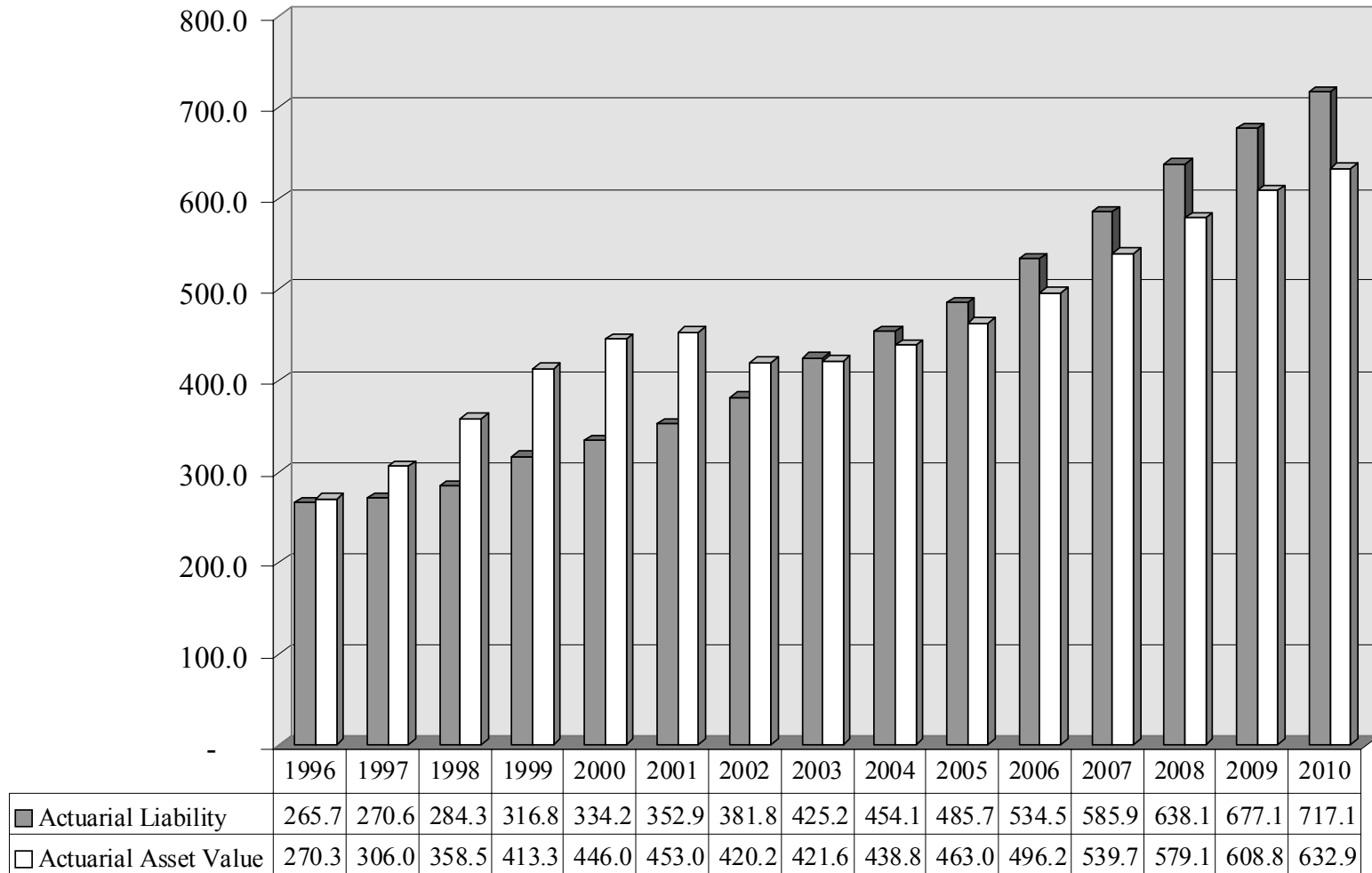
# Funded Status Miscellaneous



6/30/09 & 6/30/10 funded status estimated



## Funded Status (Millions) Miscellaneous



6/30/09 & 6/30/10 funded status estimated



## Contribution Rates Miscellaneous

- Investment gains/(losses) – Impact on funded status:
  - Actuarial asset “reserve” at 6/30/08 2.0%
  - 6/30/09 [-24.8% compared to 7.75%] -32.6%
  - 6/30/10 [14.4%%compared to 7.75%] 6.6%
  - Total estimated % loss through 6/30/10 -24.0%
  - Total estimated unrecognized gain \$ -141.5 million  
[-24.0% x \$ 591 ]

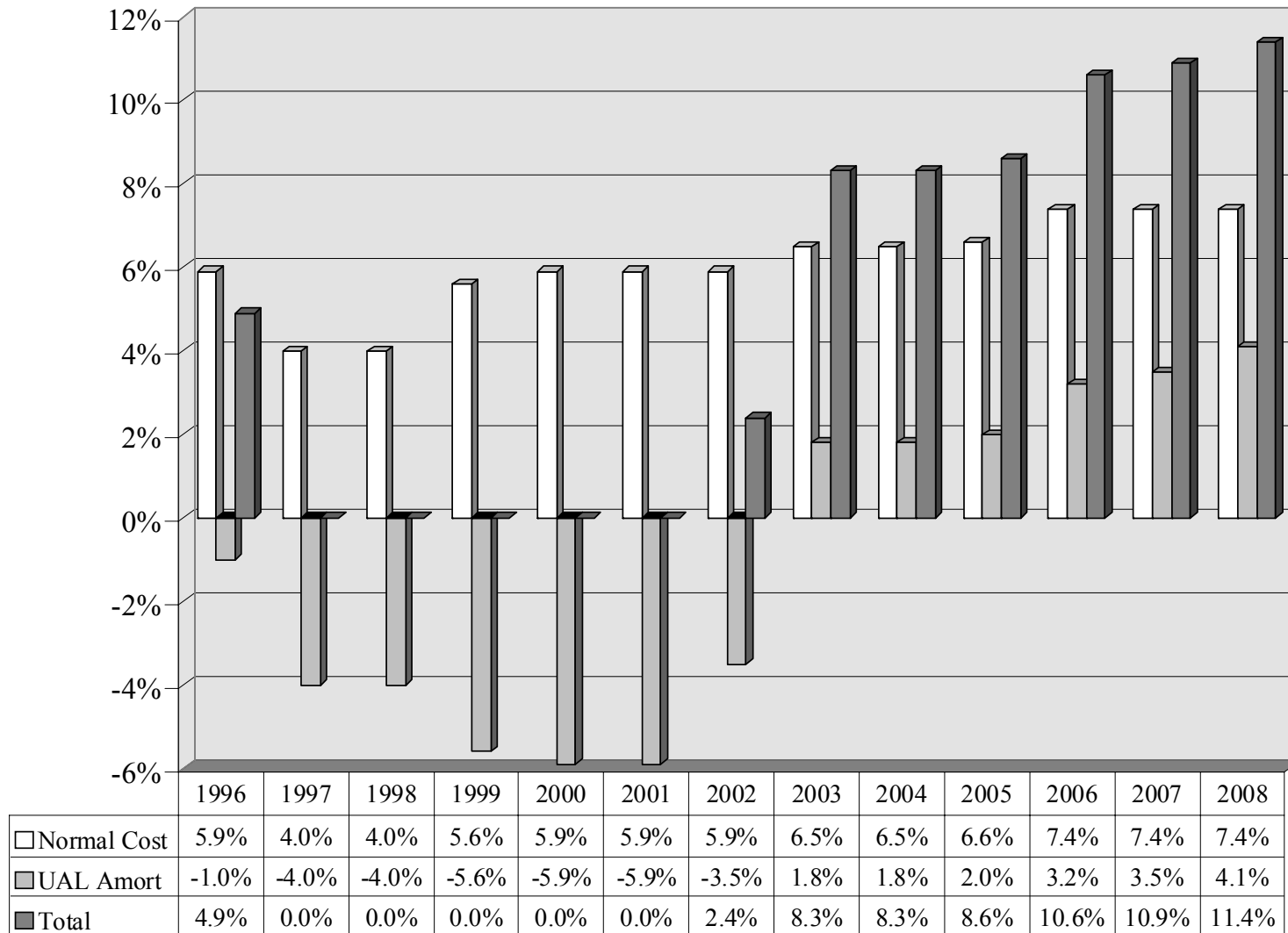
			Projected	
	<u>6/30/07</u>	<u>6/30/08</u>	<u>6/30/10</u>	<u>6/30/40</u>
■ UAL <sup>10</sup> (millions)	\$ 46.2	\$59.0	\$60.0	\$19.2
■ Investment losses 08/09 <sup>11</sup>			180.6	234.8
■ Investment gains 09/10 <sup>4</sup>			<u>-39.2</u>	<u>-51.0</u>
■ Total			<b>201.4</b>	<b>203.0</b>

<sup>10</sup> Does not include asset gains or losses after June 30, 2008.

<sup>11</sup> Ignores future gains & losses (after 6/30/09) and asset smoothing, and assumes continuance of 30-year rolling amortization method.



## Contribution Rates Miscellaneous



## Contribution Rates Miscellaneous

	<u>6/30/07</u> <u>2009/2010</u>	<u>6/30/08</u> <u>2010/2011</u>
■ Normal cost	7.4%	7.4%
■ Amortization bases:		
● Method Change	-0.2%	-0.2%
● (Gain)/Loss	-0.1%	0.6%
● Benefit Changes	1.8%	1.7%
● Fresh Start	<u>2.0%</u>	<u>1.9%</u>
Sub-total	<u>3.5%</u>	<u>4.1%</u>
● <b>Total:</b>	<b>10.9%</b>	<b>11.4%</b>
● Amortization period	Multiple ≈ 16 years	Multiple ≈ 17 years
■ What Happened from 6/30/07 to 6/30/08:		
● 2009/10 Rate	10.9%	
● (Gains)/Losses	<u>0.6</u>	
● 2010/11 Rate	11.5%	

## Contribution Projections Miscellaneous

■ Market Value Investment Return:

- June 30, 2009 -24.8%<sup>12</sup>
- Estimated June 30, 2010 14.4%<sup>13</sup>
- June 30, 2011 - 2014 75% Confidence Limit<sup>14</sup>: ≈ **0.4% - 3.6%**
- 50% Confidence Limit: ≈ **7.75%**
- 25% Confidence Limit: ≈ **11.8% - 15.3%**

■ Fresh Starts:

● **No Fresh Starts for 10/11**

- 15 Year 0.4% 20 Year -0.3% 25 Year -0.8%

■ No Other:

- Gains or Losses
- Method or Assumption Changes
- Benefit Improvements

■ Estimated \$180.6 million market value loss:

- Results in 5.0% 2011/12 contribution rate increase ( ≈ \$ 6.6 million)
- 30 year amortization would be 8.3% rate increase ( ≈ \$ 10.8 million)

<sup>12</sup> Estimated based on CalPERS 6/30/09 published rate of return or -23.5%, adjusted by published 6/30/09 values for real estates and AIM.

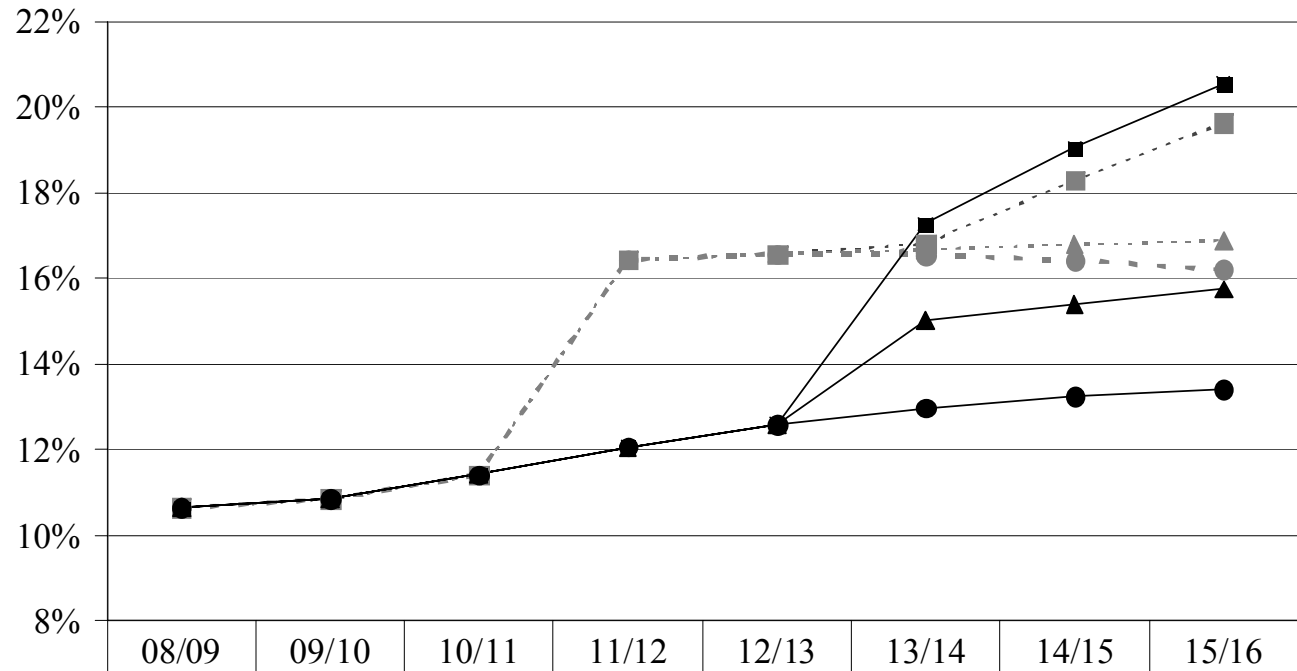
<sup>13</sup> Estimate based on CalPERS 12/31/09 published rate of return of 12.6%, a loss of 1.5% through 1/31/10 based on CalPERS market value from the website and 7.75% thereafter.

<sup>14</sup> Confidence Limits – Actual Return will exceed the given rate with indicated probabilities, rates vary by year.



# Contribution Projections Miscellaneous

**Investment Return Varies  
and No Fresh Start 10/11**



	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
---■--- Unmodified AVA - 75th	10.6%	10.9%	11.4%	16.4%	16.6%	16.8%	18.3%	19.6%
---▲--- Unmodified AVA - 50th	10.6%	10.9%	11.4%	16.4%	16.6%	16.7%	16.8%	16.9%
-●- Unmodified AVA - 25th	10.6%	10.9%	11.4%	16.4%	16.6%	16.6%	16.4%	16.2%
—■— Modified AVA - 75th	10.6%	10.9%	11.4%	12.1%	12.6%	17.3%	19.1%	20.6%
—▲— Modified AVA - 50th	10.6%	10.9%	11.4%	12.1%	12.6%	15.0%	15.4%	15.7%
—●— Modified AVA - 25th	10.6%	10.9%	11.4%	12.1%	12.6%	13.0%	13.3%	13.4%



## Contribution Policy

- Consider policy implications of not increasing CalPERS contributions:
  - UAL not being paid off
  - Generational shift of Unfunded Liability
- Similar to minimum payment on credit card balance

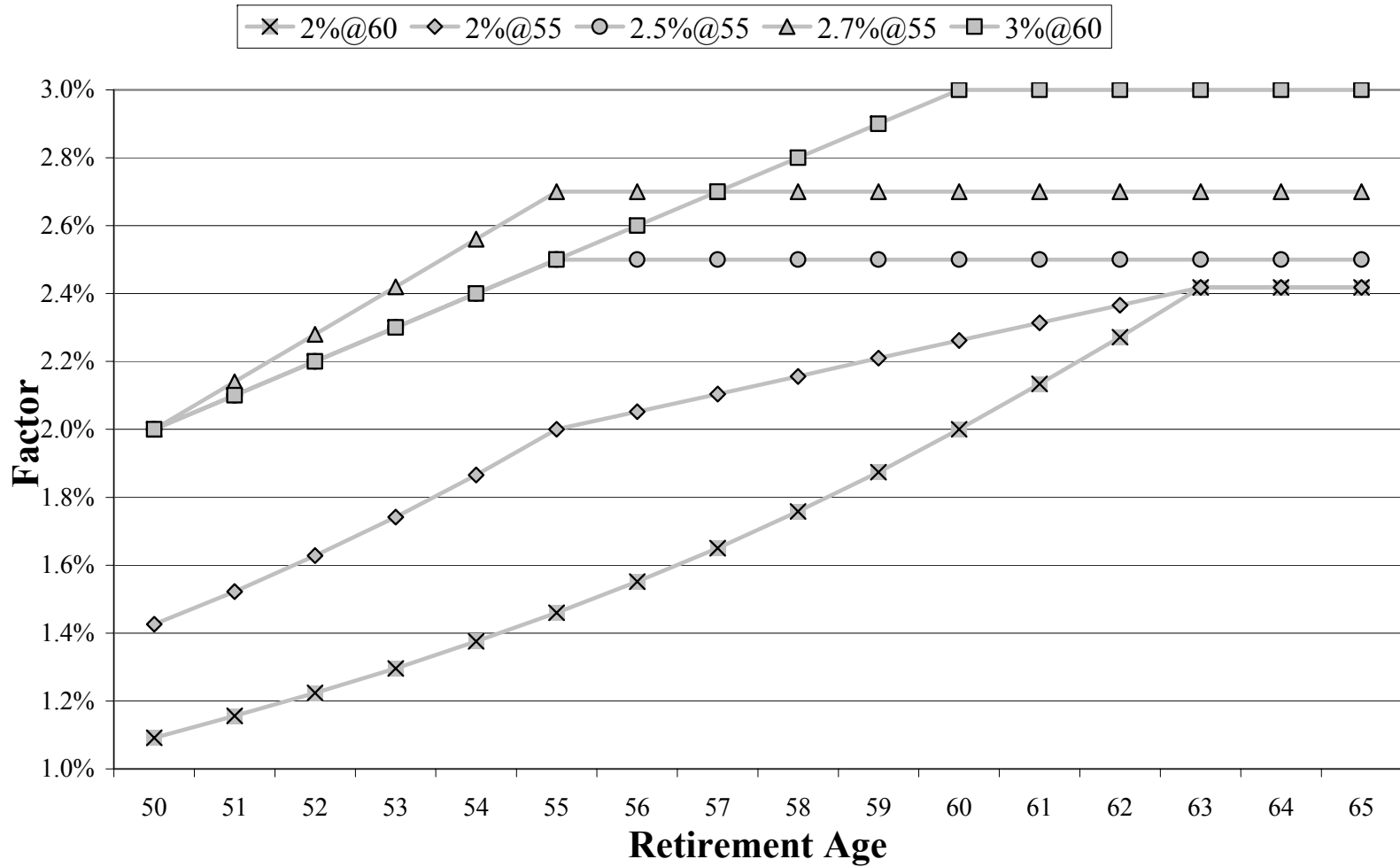


## Contribution Policy

- Consider one of the following:
  - **Fresh start with declining period**
    - 2009/10                      30 years
    - 2010/11                      29 years
    - ↓    ↓
    - CalPERS will not automatically do this
  - **Adjust contribution to amortize based on either:**
    - A. Full June 30, 2009 market value loss or
    - B. Schedule using un-modified actuarial value
    - CalPERS will not automatically do this
    - Requires:
      - Asking CalPERS to use “Fresh Start”
      - Higher rates 2011/12 and beyond
  - **Use fixed amortization schedule:**
    - CalPERS will not keep track of bases
    - Requires:
      - Asking CalPERS to use “Fresh Start”
      - Shorter amortization period

# Benefit Factors Miscellaneous

## Benefit Factor Comparison



## Benefit Factors Miscellaneous

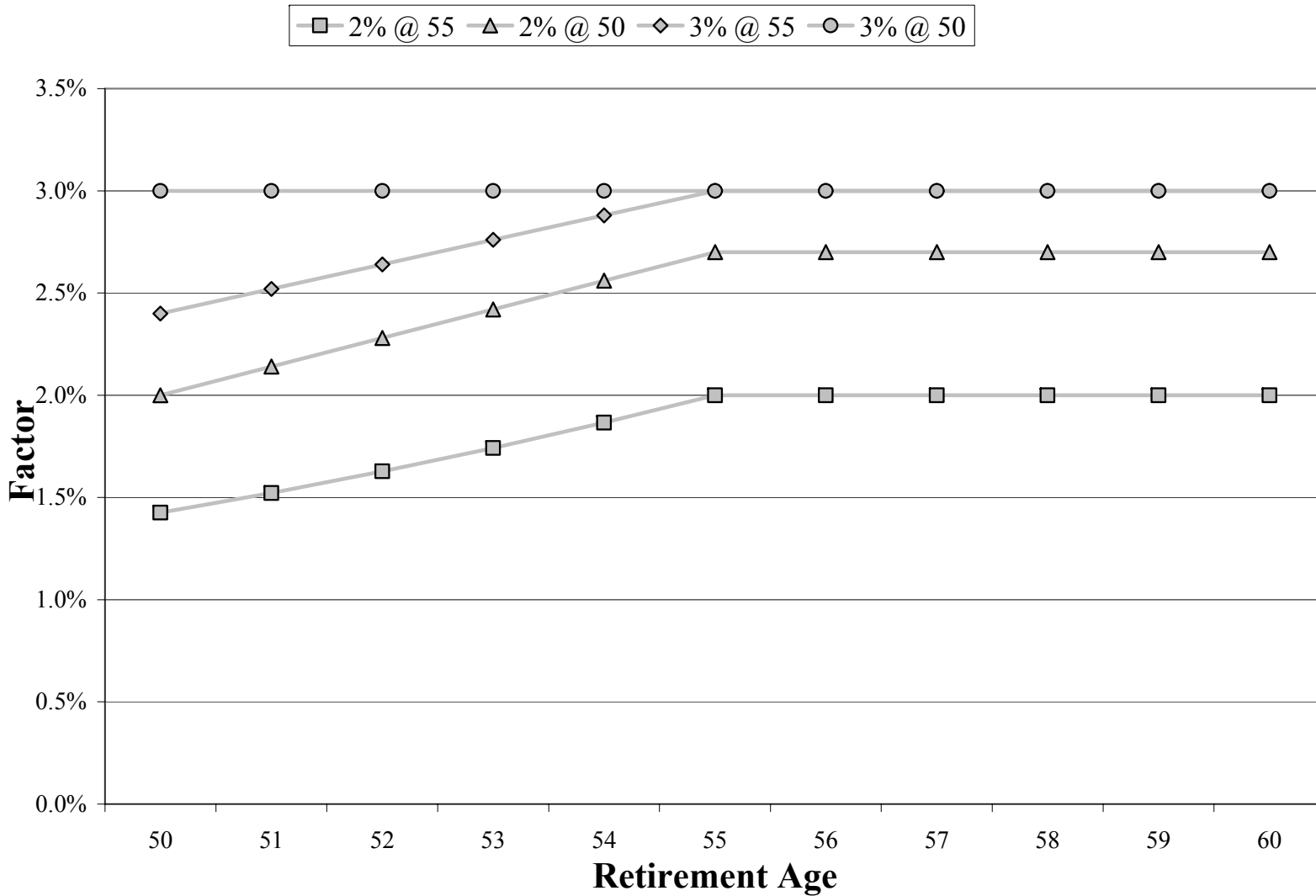
	<u>2%@60</u>	<u>2%@55</u>	<u>2.5%@55</u>	<u>2.7%@55</u>	<u>3.0%@60</u>
<b>50</b>	1.092%	1.426%	2.000%	2.000%	2.000%
<b>51</b>	1.156%	1.522%	2.100%	2.140%	2.100%
<b>52</b>	1.224%	1.628%	2.200%	2.280%	2.200%
<b>53</b>	1.296%	1.742%	2.300%	2.420%	2.300%
<b>54</b>	1.376%	1.866%	2.400%	2.560%	2.400%
<b>55</b>	1.460%	2.000%	2.500%	2.700%	2.500%
<b>56</b>	1.552%	2.052%	2.500%	2.700%	2.600%
<b>57</b>	1.650%	2.104%	2.500%	2.700%	2.700%
<b>58</b>	1.758%	2.156%	2.500%	2.700%	2.800%
<b>59</b>	1.874%	2.210%	2.500%	2.700%	2.900%
<b>60</b>	2.000%	2.262%	2.500%	2.700%	3.000%
<b>61</b>	2.134%	2.314%	2.500%	2.700%	3.000%
<b>62</b>	2.272%	2.366%	2.500%	2.700%	3.000%
<b>63</b>	2.418%	2.418%	2.500%	2.700%	3.000%
<b>64</b>	2.418%	2.418%	2.500%	2.700%	3.000%
<b>65</b>	2.418%	2.418%	2.500%	2.700%	3.000%





# Benefit Factors Safety

## Benefit Factor Comparison



## Benefit Factors Safety

	<u>2%@55</u>	<u>2%@50</u>	<u>3%@55</u>	<u>3%@50</u>
<b>50</b>	1.426%	2.000%	2.400%	3.000%
<b>51</b>	1.522%	2.140%	2.520%	3.000%
<b>52</b>	1.628%	2.280%	2.640%	3.000%
<b>53</b>	1.742%	2.420%	2.760%	3.000%
<b>54</b>	1.866%	2.560%	2.880%	3.000%
<b>55</b>	2.000%	2.700%	3.000%	3.000%
<b>56</b>	2.000%	2.700%	3.000%	3.000%
<b>57</b>	2.000%	2.700%	3.000%	3.000%
<b>58</b>	2.000%	2.700%	3.000%	3.000%
<b>59</b>	2.000%	2.700%	3.000%	3.000%
<b>60</b>	2.000%	2.700%	3.000%	3.000%

## Current Benefits

	<b>Miscellaneous</b>	<b>Safety</b>
● Benefit Formula	2.5% @ 55	3% @ 55
● FAE	Three Years (FAE3)	One Year (FAE1)
● PRSA	Yes	Yes
● COLA	2%	2%
● EPMC	8%, by Resolution	9%, by Resolution
● 10/11 ER Contribution		
➢ Normal Cost	7.4%	14.9%
➢ Amortizations	<u>4.0</u>	<u>8.7</u>
➢ Subtotal	11.4	23.6
● EPMC	8.0	9.0
● Rates on EPMC (PERS on PERS)		
➢ Normal Cost	0.6	1.3
➢ Amortization	<u>0.3</u>	<u>0.8</u>
➢ Subtotal	<u>0.9</u>	<u>2.1</u>
● Total	20.3	34.7

## Alternative Benefits

- **Alternative Benefits – Employees Hired  $\geq$  7/1/10**
  - Miscellaneous: 2%@55 FAE3, 2%@60 FAE3
  - Safety: 2%@50 FAE3, 2%@55 FAE3
- **Estimated ER Normal Cost**
  - Based on Pool Normal Cost
  - Adjusted for demographic difference
  - Employer Pays EPMC

Formula	Miscellaneous		Safety	
	2%@55 FAE3	2%@60 FAE3	2%@50 FAE3	2%@55 FAE3
➤ Normal Cost	6.0%	5.1%	10.7%	10.3%
➤ Surcharge for Class 1 Benefits	<u>0.7</u>	<u>0.6</u>	<u>1.3</u>	<u>1.1</u>
➤ Subtotal	6.7	5.7	12.0	11.4
➤ EPMC	7.0	7.0	9.0	8.0
➤ PERS on PERS	<u>0.5</u>	<u>0.4</u>	<u>1.1</u>	<u>0.9</u>
➤ Total	14.1	13.1	22.1	20.2
➤ Saving from current formula	1.8%	2.8%	3.1%	5.0%

## Alternative Benefits

### ☐ Employee Pays EPMC

Formula	Miscellaneous		Safety	
	2% <u>@55</u> FAE3	2% <u>@60</u> FAE3	2% <u>@50</u> FAE3	2% <u>@55</u> FAE3
➤ Normal Cost	6.0%	4.8%	10.7%	10.3%
➤ Surcharge for Class 1 Benefits	<u>0.7</u>	<u>1.4</u>	<u>1.3</u>	<u>1.0</u>
➤ Subtotal	6.7	6.2	12.0	11.3
➤ EPMC	0.0	0.0	0.0	0.0
➤ PERS on PERS	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
➤ Total	6.7	6.2	12.0	11.3
➤ Saving from current formula	9.2%	10.2%	13.2%	13.9%

### ■ Estimated Savings

- Projection based on benefits earned, not benefits being paid out
- Savings % apply to Tier 2 payroll

## Alternative Benefits

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**Projected Payroll  
(000's)**

**Miscellaneous  
Both Tier 1 & Tier 2 with EPMC**

<b>Year</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Total</b>
2010/11	\$ 115,270	\$ 7,113	\$ 122,382
2011/12	111,206	15,154	126,360
2012/13	107,998	22,468	130,466
2013/14	104,616	30,091	134,707
2014/15	100,654	38,431	139,085
2015/16	97,092	46,513	143,605
2016/17	92,576	55,696	148,272
2017/18	88,067	65,023	153,091
2018/19	83,577	74,490	158,066
2019/20	78,256	84,947	163,203
2020/21	73,448	95,059	168,508



**Projected Payroll  
(000's)**

**Miscellaneous**

**Tier 1 with EPMC, Tier 2 without EPMC**

<b>Year</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Total</b>
2010/11	\$ 115,270	\$ 6,586	\$ 121,855
2011/12	111,206	14,032	125,237
2012/13	107,998	20,804	128,802
2013/14	104,616	27,862	132,478
2014/15	100,654	35,584	136,238
2015/16	97,092	43,067	140,159
2016/17	92,576	51,570	144,146
2017/18	88,067	60,207	148,274
2018/19	83,577	68,972	152,549
2019/20	78,256	78,655	156,911
2020/21	73,448	88,018	161,466





**Projected Payroll  
(000's)**

**Safety**

**Tier 1 & Tier 2 with EPMC**

<b>Year</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Total</b>
2010/11	\$ 45,463	\$ 1,864	\$ 47,326
2011/12	45,009	3,855	48,864
2012/13	44,249	6,203	50,452
2013/14	43,182	8,910	52,092
2014/15	41,592	12,193	53,785
2015/16	40,350	15,183	55,533
2016/17	38,849	18,489	57,338
2017/18	37,243	21,958	59,201
2018/19	35,200	25,925	61,126
2019/20	33,149	29,963	63,112
2020/21	31,200	33,963	65,163



**Projected Payroll  
(000's)**

**Safety**

**Tier 1 with EPMC, Tier 2 without EPMC**

<b>Year</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Total</b>
2010/11	\$ 45,463	\$ 1,710	\$ 47,172
2011/12	45,009	3,537	48,546
2012/13	44,249	5,691	49,940
2013/14	43,182	8,174	51,356
2014/15	41,592	11,186	52,778
2015/16	40,350	13,929	54,280
2016/17	38,849	16,962	55,811
2017/18	37,243	20,145	57,388
2018/19	35,200	23,784	58,985
2019/20	33,149	27,489	60,638
2020/21	31,200	31,159	62,359



**Estimated Savings**  
(000's)

**Miscellaneous**  
**Tier 1 & Tier 2 with EPMC**

Year	2%@55			2%@60		
	Employer Contr. Savings	Employee Contr. Savings	Total Savings	Employer Contr. Savings	Employee Contr. Savings	Total Savings
2010/11	\$ 46	\$ 66	\$ 112	\$ 118	\$ 66	\$ 184
2011/12	99	140	239	250	140	390
2012/13	146	208	354	371	208	579
2013/14	196	279	475	497	279	776
2014/15	250	356	606	635	356	991
2015/16	303	431	734	769	431	1,200
2016/17	363	516	879	921	516	1,437
2017/18	424	602	1,026	1,075	602	1,677
2018/19	485	690	1,175	1,231	690	1,921
2019/20	553	787	1,340	1,404	787	2,191
2020/21	619	880	1,499	1,571	880	2,451



**Estimated Savings**  
(000's)

**Miscellaneous**  
**Tier 1 with EPMC, Tier2 without EPMC**

Year	2%@55			2%@60		
	Employer Contr. Savings	Employee Contr. Savings	Total Savings	Employer Contr. Savings	Employee Contr. Savings	Total Savings
2010/11	\$ 82	\$ 527	\$ 609	\$ 148	\$ 527	\$ 675
2011/12	174	1,123	1,297	315	1,123	1,438
2012/13	258	1,664	1,922	467	1,664	2,131
2013/14	346	2,229	2,575	625	2,229	2,854
2014/15	442	2,847	3,289	798	2,847	3,645
2015/16	535	3,445	3,980	966	3,445	4,411
2016/17	640	4,126	4,766	1,157	4,126	5,283
2017/18	747	4,817	5,564	1,350	4,817	6,167
2018/19	856	5,518	6,374	1,547	5,518	7,065
2019/20	976	6,292	7,268	1,764	6,292	8,056
2020/21	1,093	7,041	8,134	1,974	7,041	9,015



**Estimated Savings**  
(000's)

**Safety**  
**Tier 1 & Tier 2 with EPMC**

	<b>2%@50</b>			<b>2%@55</b>		
<b>Year</b>	<b>Employer Contr. Savings</b>	<b>Employee Contr. Savings</b>	<b>Total Savings</b>	<b>Employer Contr. Savings</b>	<b>Employee Contr. Savings</b>	<b>Total Savings</b>
2010/11	\$ 54	\$ -	\$ 54	\$ 66	\$ 17	\$ 83
2011/12	111	-	111	137	35	172
2012/13	179	-	179	221	57	278
2013/14	257	-	257	318	82	400
2014/15	351	-	351	435	112	547
2015/16	437	-	437	541	139	680
2016/17	533	-	533	659	170	829
2017/18	633	-	633	783	201	984
2018/19	747	-	747	924	238	1,162
2019/20	863	-	863	1,068	275	1,343
2020/21	978	-	978	1,211	312	1,523



**Estimated Savings**  
(000's)

**Safety**

**Tier 1 with EPMC, Tier 2 without EPMC**

	<b>2%@50</b>			<b>2%@55</b>		
<b>Year</b>	<b>Employer Contribution Savings</b>	<b>Employee Contribution Savings</b>	<b>Total Savings</b>	<b>Employer Contribution Savings</b>	<b>Employee Contribution Savings</b>	<b>Total Savings</b>
2010/11	\$ 72	\$ 154	\$ 226	\$ 84	\$ 154	\$ 238
2011/12	149	318	467	174	318	492
2012/13	240	512	752	279	512	791
2013/14	345	736	1,081	401	736	1,137
2014/15	472	1,007	1,479	549	1,007	1,556
2015/16	588	1,254	1,842	683	1,254	1,937
2016/17	716	1,527	2,243	832	1,527	2,359
2017/18	851	1,813	2,664	988	1,813	2,801
2018/19	1,004	2,141	3,145	1,167	2,141	3,308
2019/20	1,161	2,474	3,635	1,349	2,474	3,823
2020/21	1,316	2,804	4,120	1,529	2,804	4,333



## CalPERS Two Tier Options Non Pooled Plan

- Option One
  - Two separate plans, two separate rates
  - Tier 1 (Current Plan)
    - Closed to new employees
    - Gains/Losses amortized over decreasing payroll
    - ER rate increases
    - Forced to pool once counts drop below 100 & set up side fund
  - Tier 2 (New Plan)
    - New employees join Tier 2
    - Lower ER rate
    - Stays in pool until counts  $> 100$
  - Actual saving less because Tier 2 has to pay for pool amortization



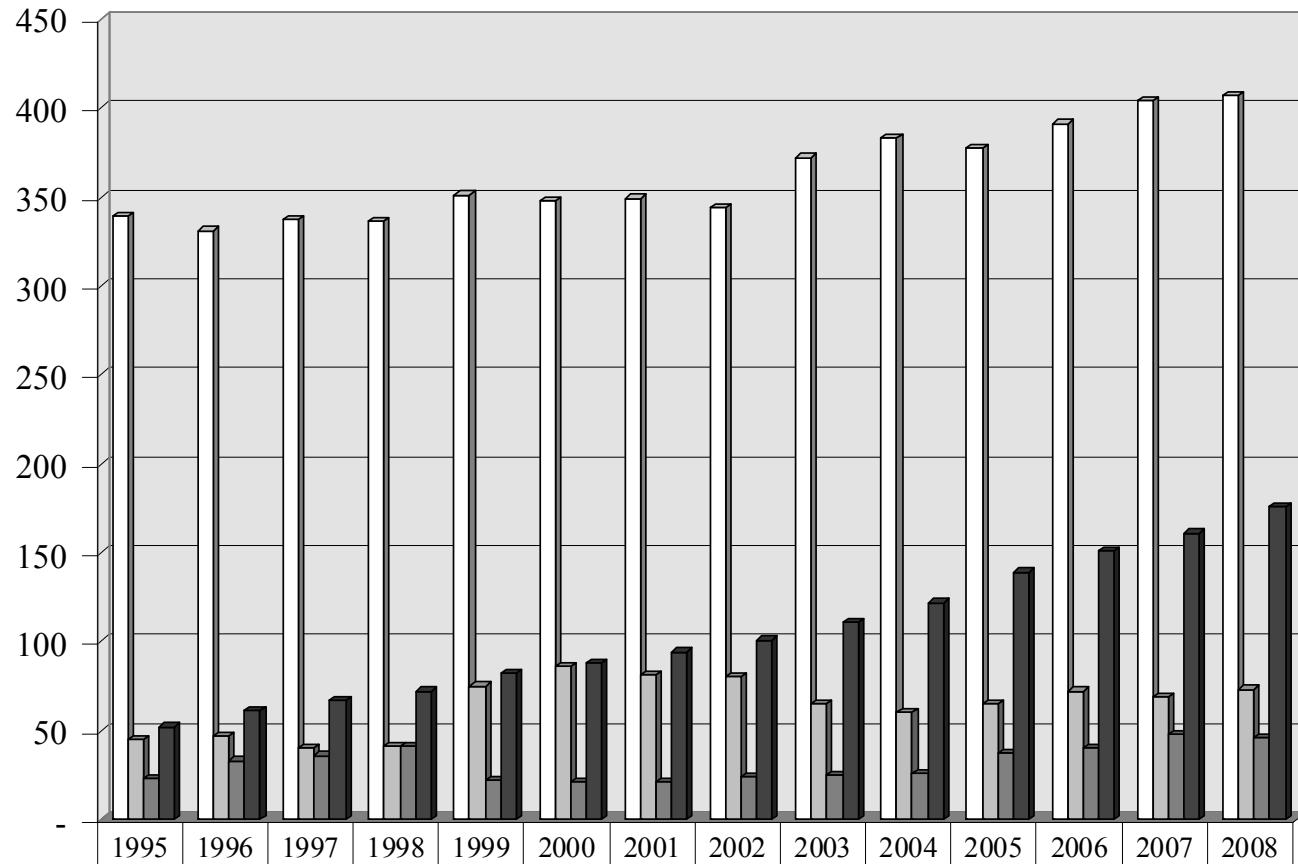
## CalPERS Two Tier Options Non Pooled Plan

- Option Two
  - Two formulas/tiers, one blended rate
  - No rate impact until 3 years later
    - e.g. if Tier 2 effective 7/1/10, no rate impact until FY 2013/14
  - ER rate decreases gradually as employees hired
  - Actual saving less because no rate impact until FY 2013/14 (3 years after change)
- Option Three
  - Combined Option One and Two
  - Two separate rates for first 3 years (as in Option One)
  - Then merged to one blended rate, similar to Option Two
  - Actual saving slightly less





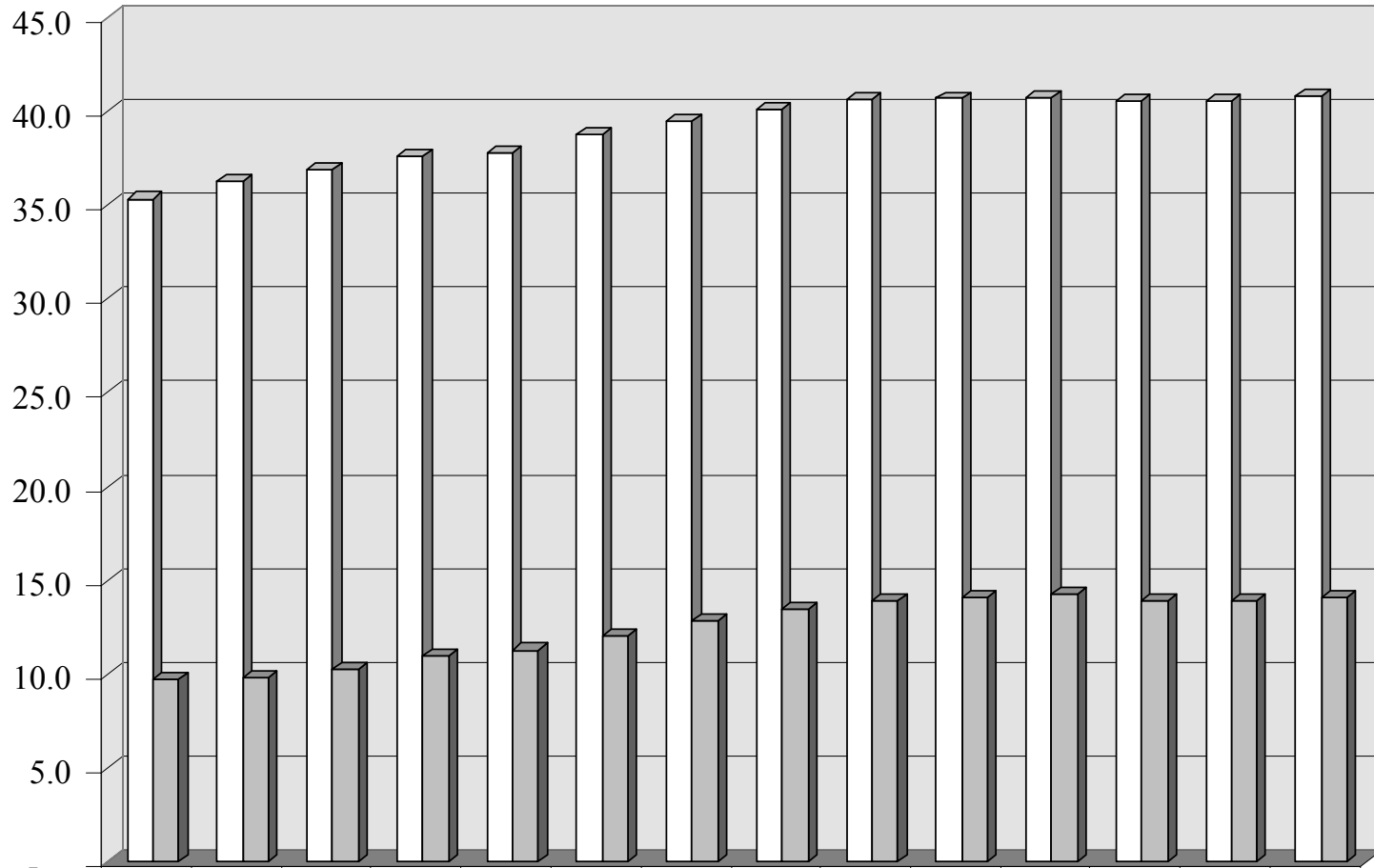
## Members Included in Valuation Safety



□ Active	339	331	337	336	351	348	349	344	372	383	377	391	404	407
▒ Transfers	45	47	40	41	75	86	81	80	65	60	65	72	69	73
▓ Vested Terminations	23	33	36	41	22	21	21	24	25	26	37	40	48	46
■ Receiving Payments	52	61	67	72	82	88	94	101	111	122	139	151	161	176



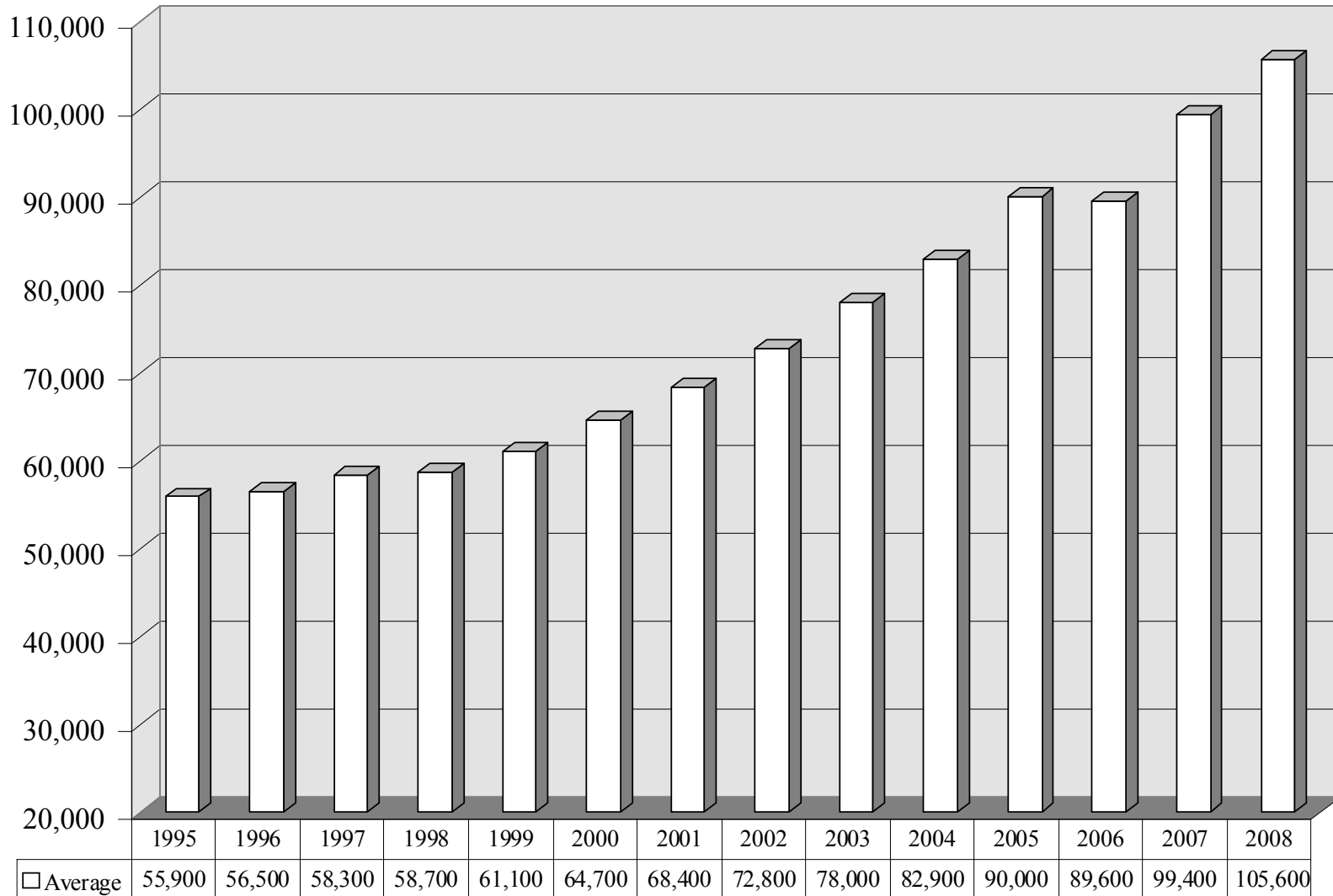
## Average Age/Service Safety



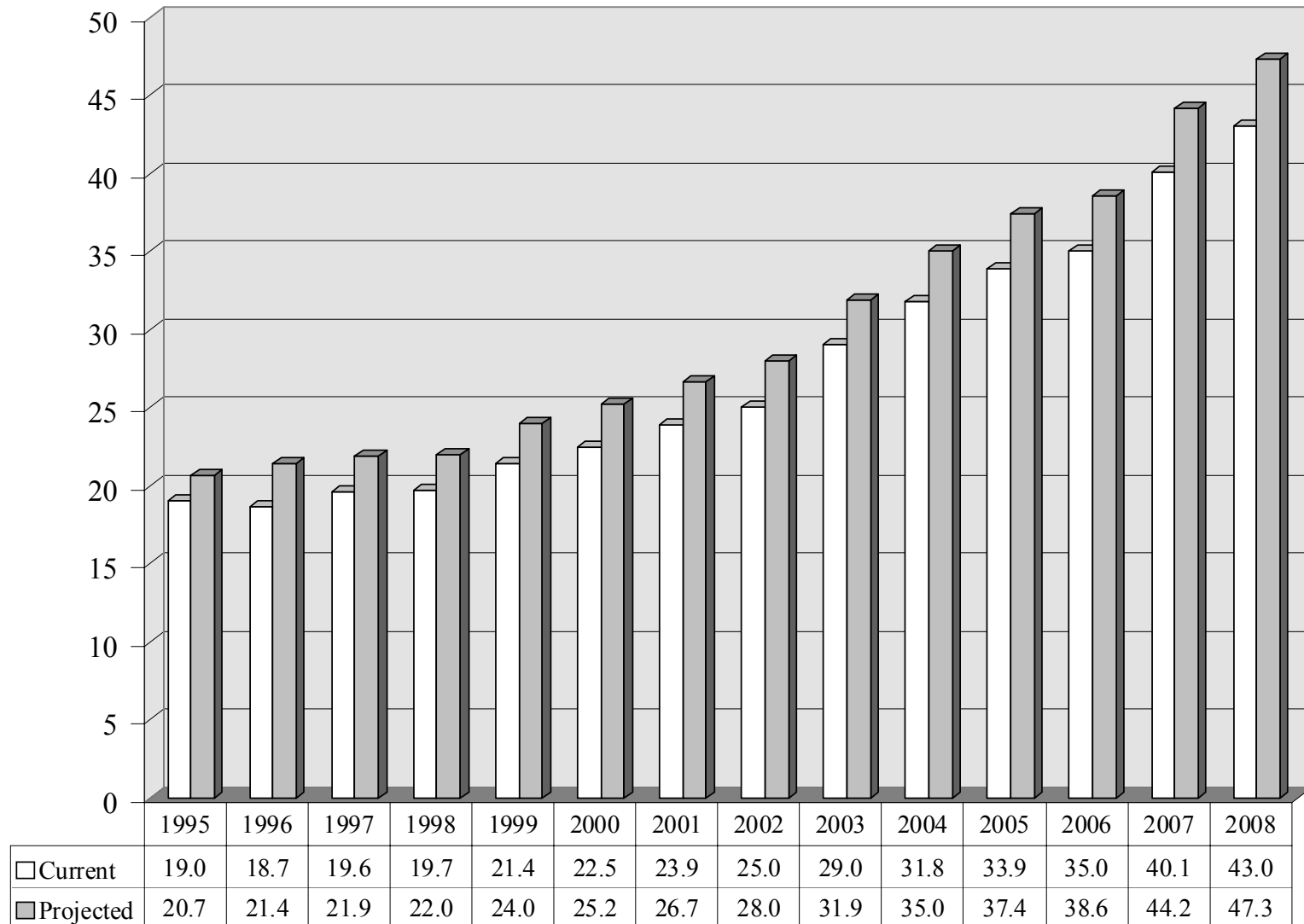
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
□ Average Age	35.3	36.3	36.9	37.6	37.8	38.7	39.5	40.1	40.6	40.7	40.7	40.5	40.5	40.9
■ Average Service	9.7	9.8	10.2	11.0	11.3	12.0	12.9	13.5	13.9	14.1	14.3	13.9	13.9	14.1



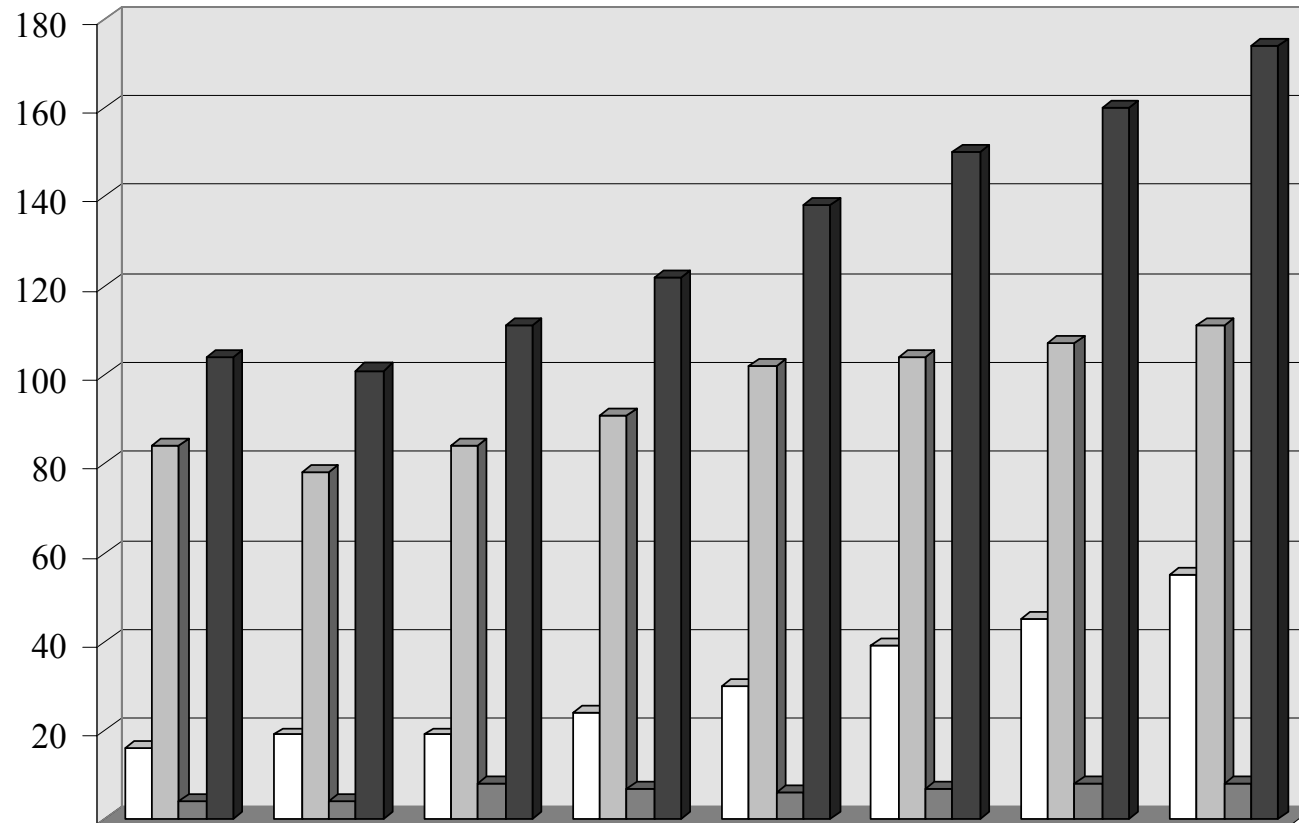
## Average PERSable Wages Safety



## Total Annual PERSable Wages (Millions) Safety



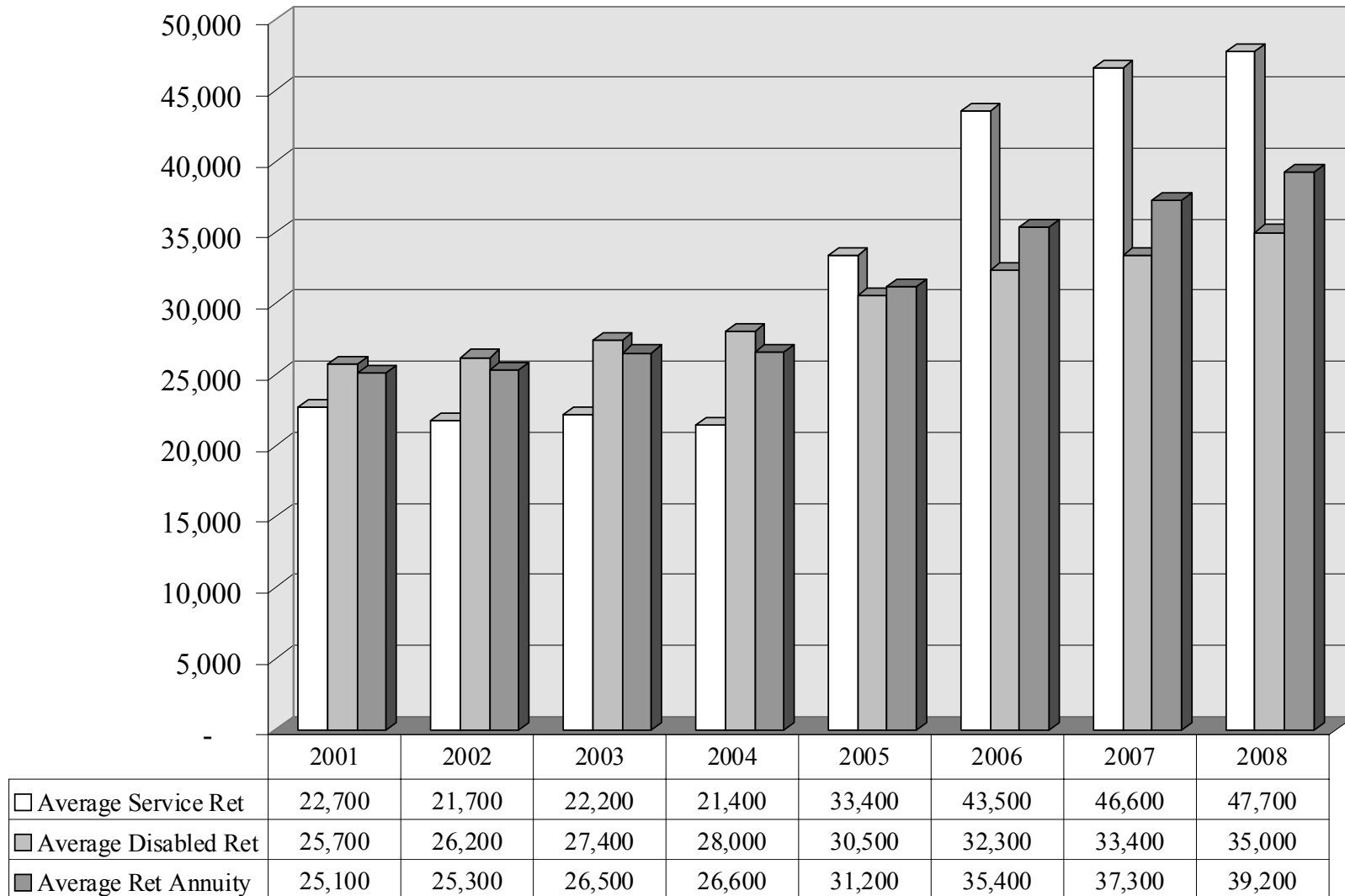
## Members Receiving Payments Safety



	2001	2002	2003	2004	2005	2006	2007	2008
□ Service Retirement	16	19	19	24	30	39	45	55
▒ Disability Retirement	84	78	84	91	102	104	107	111
■ Beneficiaries	4	4	8	7	6	7	8	8
■ Total Retirements	104	101	111	122	138	150	160	174



## Average Annuity Safety



## Average Annuity Safety

<b>Years Retired</b>	<b>Service Retirement Retirees' Benefit</b>							
	<b><u>2001</u></b>	<b><u>2002</u></b>	<b><u>2003</u></b>	<b><u>2004</u></b>	<b><u>2005</u></b>	<b><u>2006</u></b>	<b><u>2007</u></b>	<b><u>2008</u></b>
<b>Under 5</b>	\$ 19,036	\$ 12,997	\$ 10,751	\$ 14,442	\$ 36,469	\$ 50,388	\$ 55,642	\$ 54,775
<b>5~9</b>	34,867	31,284	29,917	27,994	25,805	26,852	13,468	13,811
<b>10~14</b>	-	44,413	44,227	45,112	46,013	35,564	42,778	38,387
<b>15-19</b>	9,827	10,024	10,224	12,367	30,521	31,133	-	50,017
<b>20-24</b>	-	-	-	4,611	-	-	32,069	32,875
<b>25-29</b>	-	-	-	-	-	-	-	-
<b>Over 30</b>	-	-	-	-	-	-	-	-
<b>All Years</b>	22,670	21,724	22,234	21,411	33,352	43,546	46,556	47,736



## Average Annuity Safety

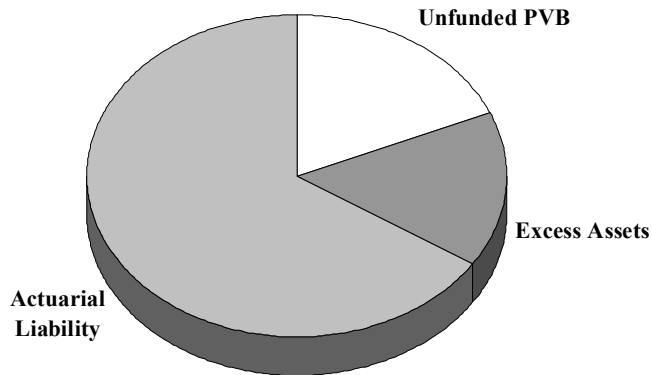
Attained	Service Retirement Retirees' Benefit							
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
<b>Age</b>								
<b>50-54</b>	\$ 11,432	\$ 17,480	\$ 17,924	\$ 8,275	\$ 34,510	\$ 46,306	\$ 48,172	\$ 59,566
<b>55-59</b>	29,004	20,898	21,483	25,687	35,026	54,416	54,103	49,695
<b>60-64</b>	32,649	36,098	42,253	26,350	27,088	29,293	39,685	37,379
<b>65-69</b>	10,583	4,692	16,728	20,144	48,703	48,706	47,403	56,342
<b>70-74</b>	-	16,898	17,235	14,326	19,248	19,634	20,183	10,879
<b>75-79</b>	4,345	-	-	-	-	-	-	32,875
<b>80-84</b>	-	4,432	4,520	4,611	-	-	-	-
<b>85 &amp; over</b>	-	-	-	-	-	-	-	-
<b>All Ages</b>	22,670	21,724	22,234	21,411	33,352	43,546	46,556	47,736



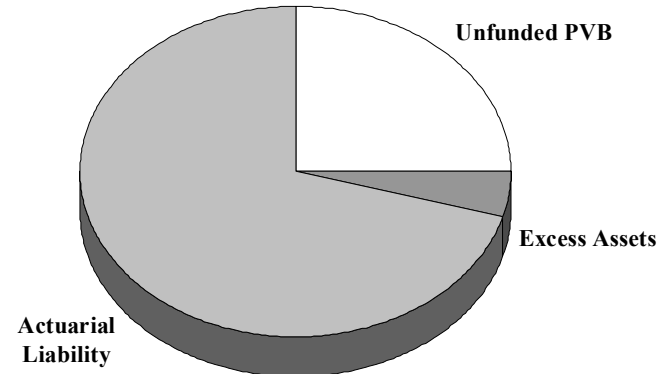


# 3% @ 55 Amendment 6/30/2001

**Present Value of Benefits  
Before 3.0% @ 55**



**Present Value of Benefits  
After 3.0% @ 55**



**Before  
3.0% @ 55**

\$	28,500,000
	24,000,000
	<u>101,000,000</u>
	153,500,000

**Unfunded PVB**  
**Excess Assets**  
**Actuarial Liability**  
**PVB**

**After  
3.0% @ 55**

\$	49,700,000
	8,600,000
	<u>140,600,000</u>
	198,900,000

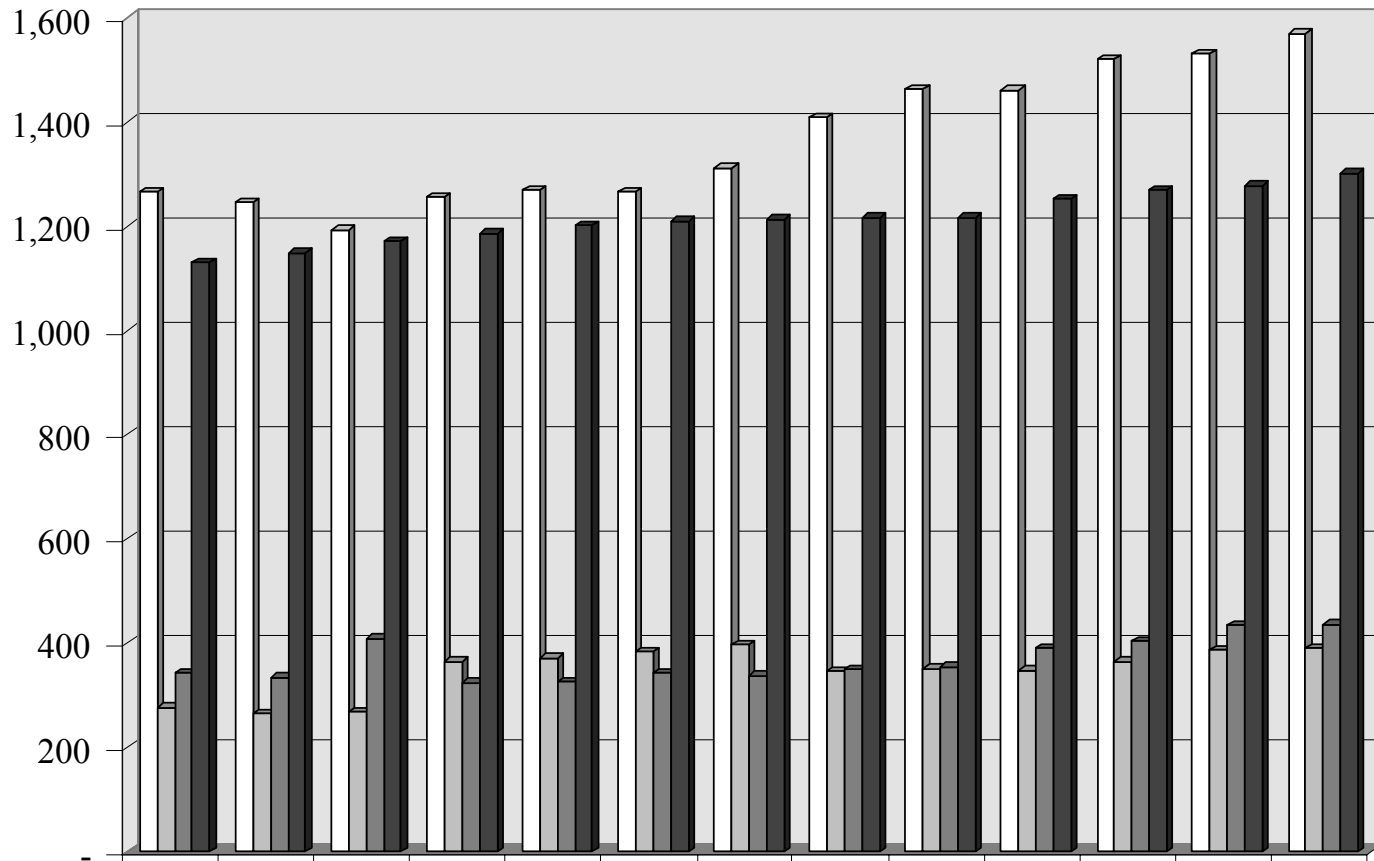


**3% @ 55**  
**Amendment 6/30/2001**

- Present Value of Benefits Increase ≈ \$ 14.5 million
- Actuarial Liability Increase ≈ \$ 12.5 million
- Employer contribution rate increase ≈ 7.0%
  - Normal Cost ≈ 2.5%
  - Prior Cost ≈ 4.5%
  - Asset Method ≈ 0.0%
  - Fresh Start ≈ 0.0%
- Employee contribution rate increase 0.0%



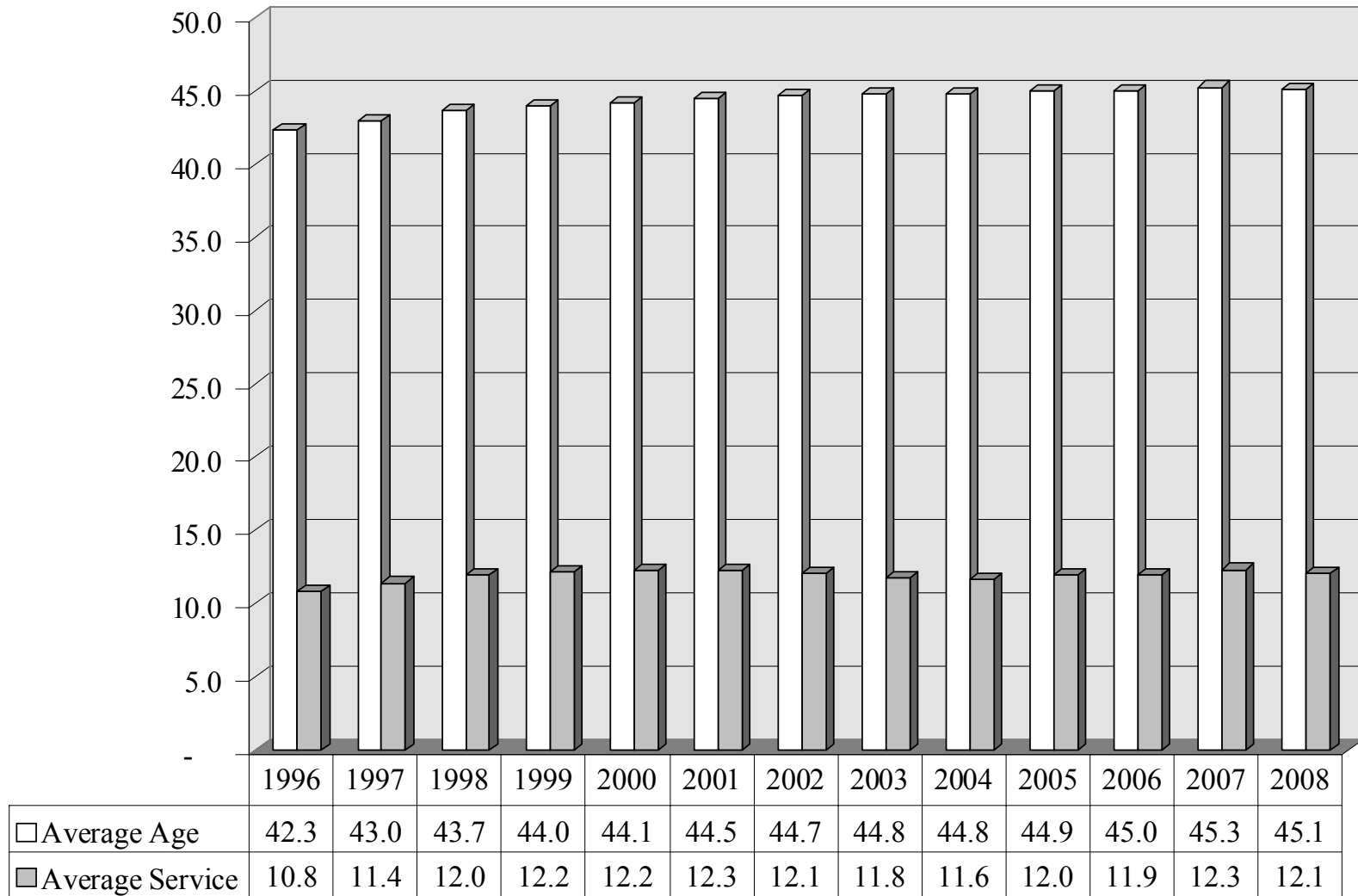
## Members Included in Valuation Miscellaneous



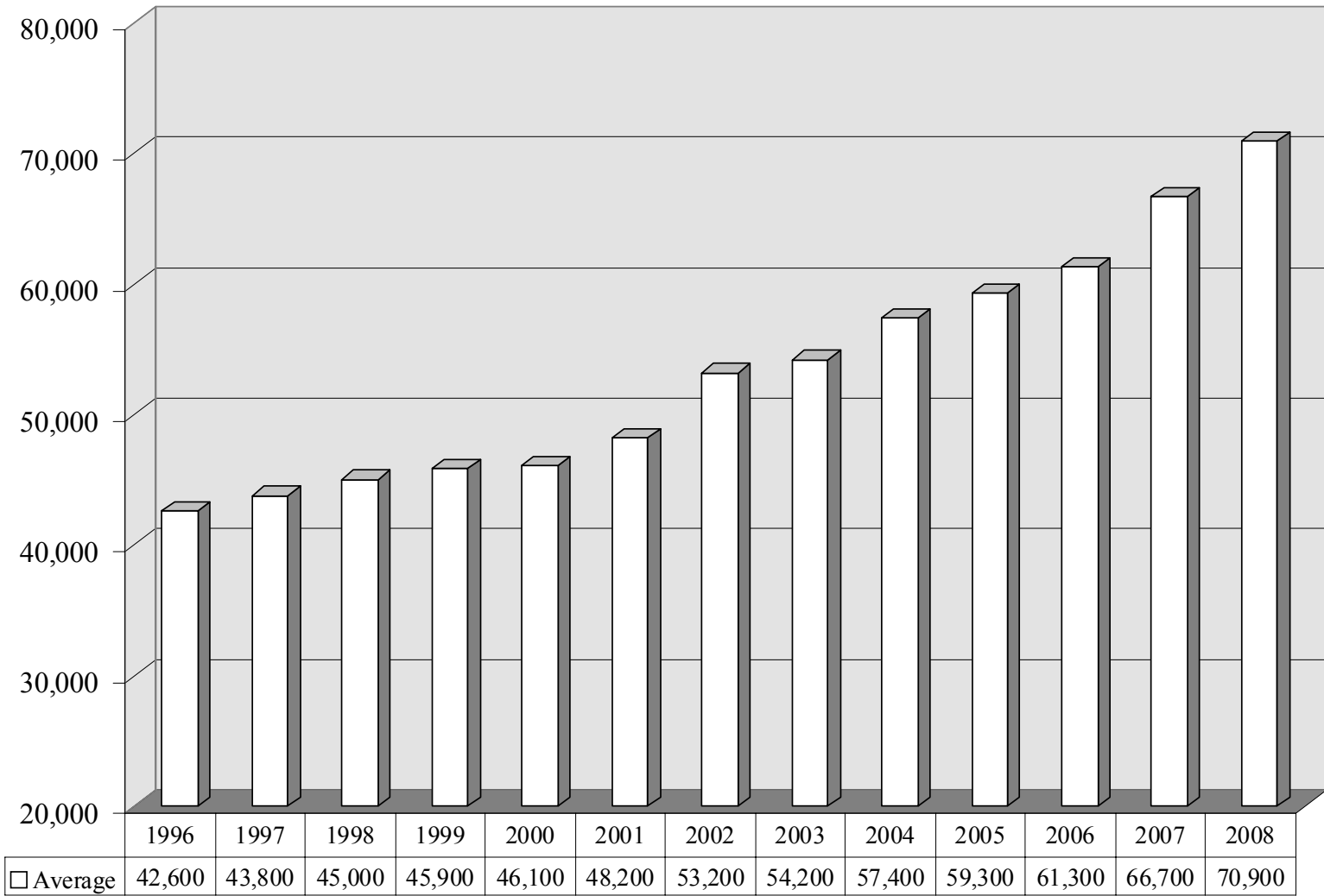
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
□ Active	1,266	1,246	1,193	1,255	1,270	1,266	1,311	1,409	1,463	1,461	1,521	1,531	1,569
▒ Transfers	276	264	268	364	372	383	397	346	352	348	364	386	390
▓ Vested Terminations	343	334	409	323	326	343	337	350	355	390	403	434	435
■ Receiving Payments	1,130	1,149	1,171	1,186	1,201	1,211	1,214	1,216	1,216	1,252	1,269	1,277	1,302



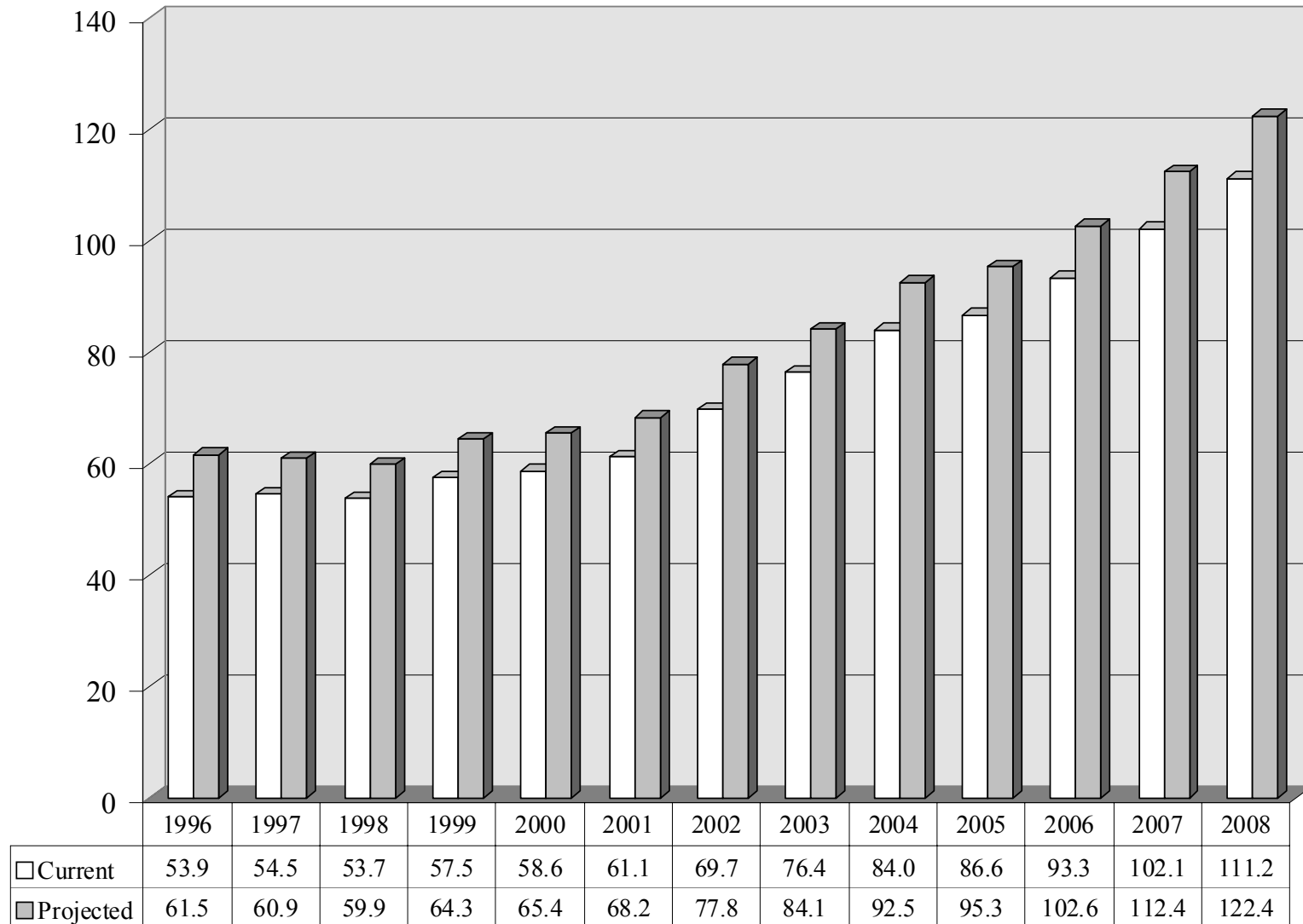
## Average Age/Service Miscellaneous



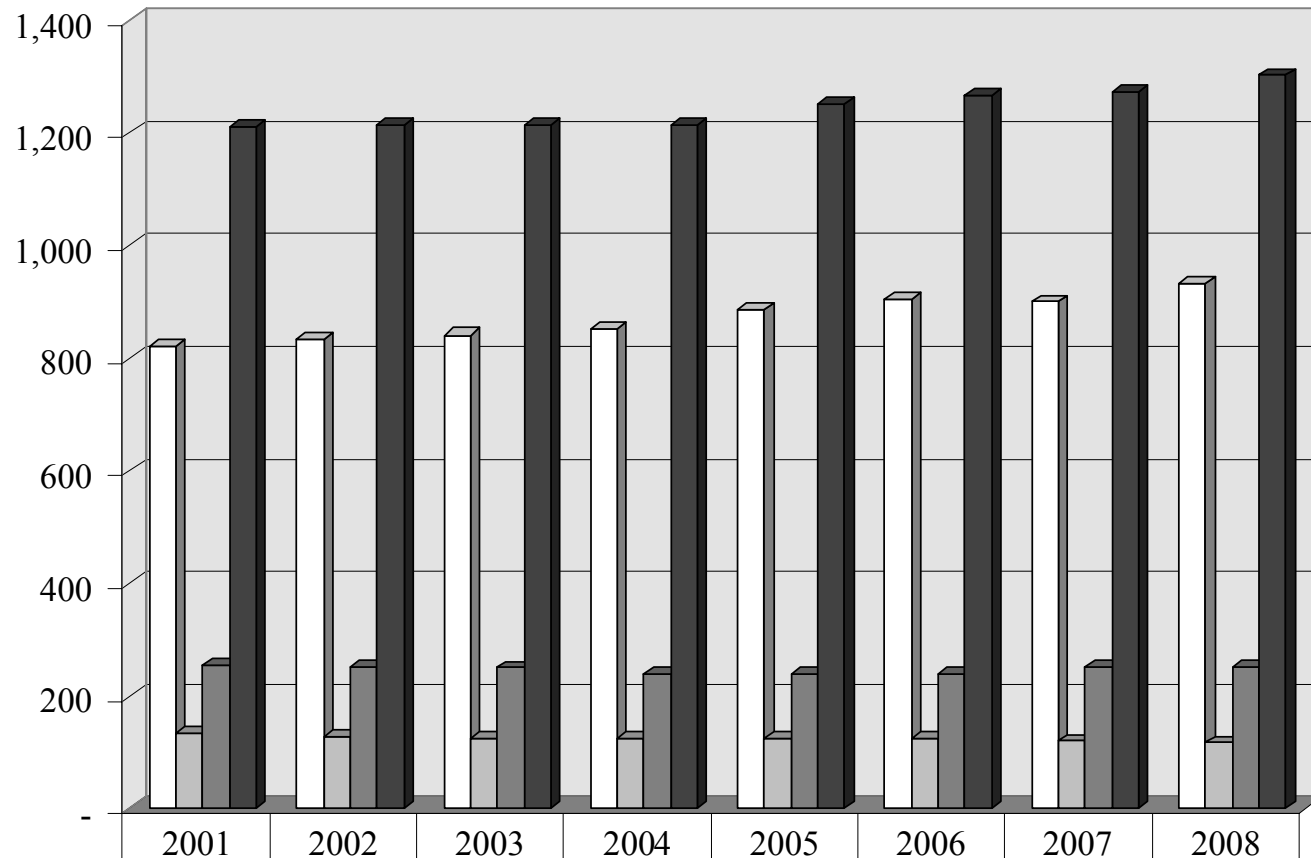
## Average PERSable Wages Miscellaneous



## Total Annual PERSable Wages (Millions) Miscellaneous



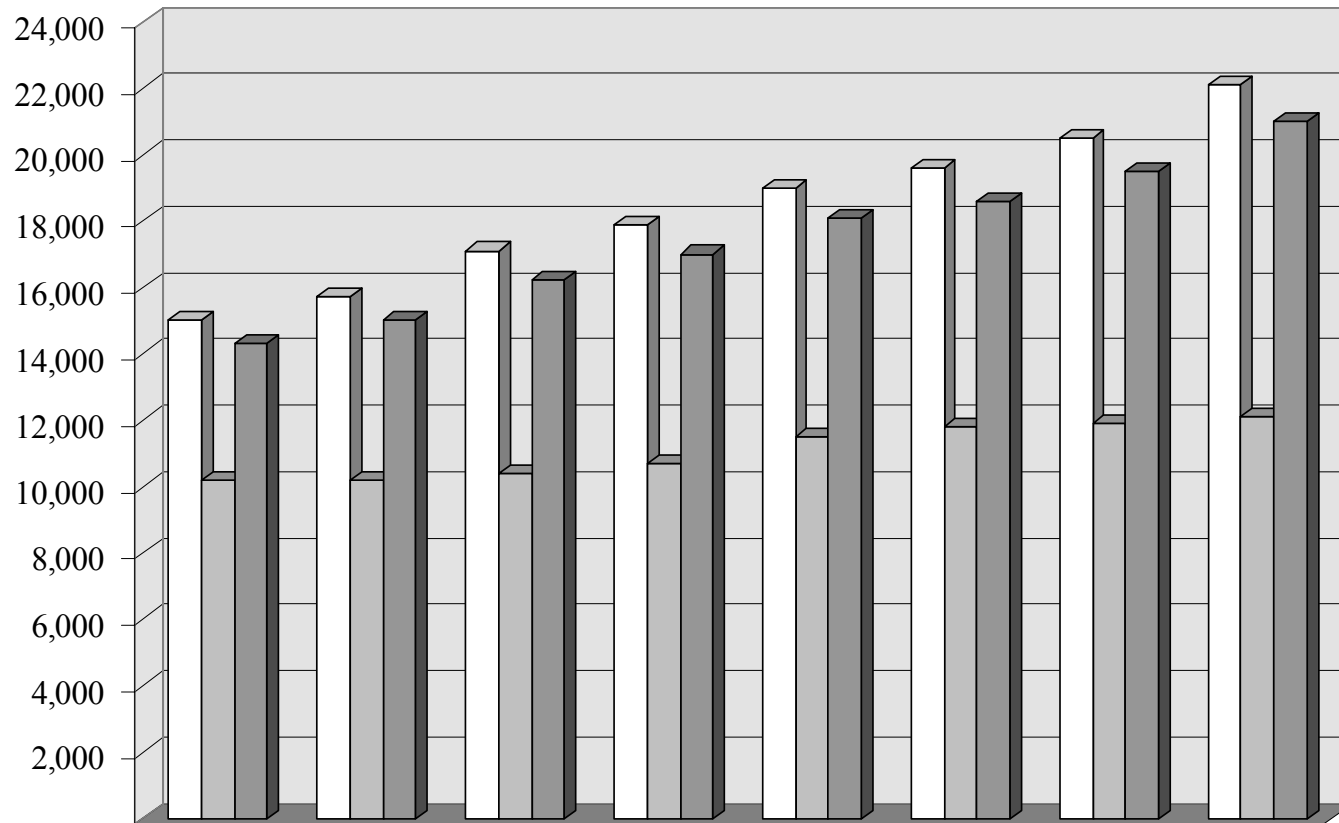
## Members Receiving Payments Miscellaneous



□ Service Retirement	822	832	841	852	886	905	900	933
■ Disability Retirement	134	129	124	124	124	124	120	117
■ Beneficiaries	254	253	250	239	240	238	253	252
■ Total Retirements	1,210	1,214	1,215	1,215	1,250	1,267	1,273	1,302



## Average Annuity Miscellaneous



	2001	2002	2003	2004	2005	2006	2007	2008
□ Average Service Ret	15,000	15,700	17,100	17,900	19,000	19,600	20,500	22,100
■ Average Disabled Ret	10,200	10,200	10,400	10,700	11,500	11,800	11,900	12,100
■ Average Ret Annuity	14,300	15,000	16,200	17,000	18,100	18,600	19,500	21,000





## Average Annuity Miscellaneous

Service Retirement Retirees' Benefit								
Years Retired	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
<b>Under 5</b>	\$ 19,461	\$ 20,575	\$ 22,926	\$ 23,343	\$ 22,607	\$ 22,037	\$ 22,965	\$ 24,766
<b>5~9</b>	18,102	18,953	19,591	20,371	22,240	22,668	23,552	25,583
<b>10~14</b>	17,099	17,033	18,657	19,070	18,248	19,018	21,232	23,011
<b>15-19</b>	16,709	16,903	18,928	19,929	20,413	21,325	19,715	19,460
<b>20-24</b>	9,059	10,584	11,390	12,688	15,237	16,487	18,740	20,696
<b>25-29</b>	6,184	7,113	7,956	8,239	11,879	12,086	11,323	12,421
<b>Over 30</b>	5,702	5,190	5,537	5,796	10,631	8,293	12,079	11,595
<b>All Years</b>	15,011	15,699	17,062	17,942	18,994	19,585	20,528	22,113



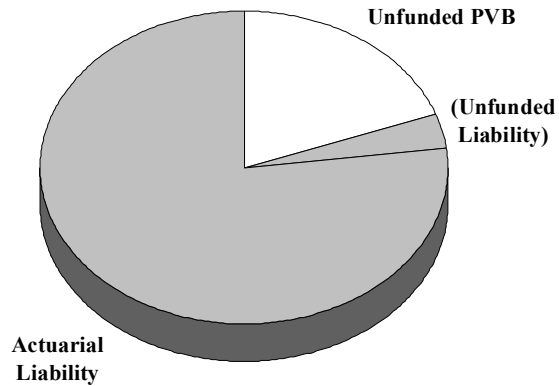
## Average Annuity Miscellaneous

Service Retirement Retirees' Benefit								
Attained <u>Age</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
<b>50-54</b>	\$ 10,579	\$ 10,428	\$ 7,597	\$ 11,042	\$ 12,233	\$ 9,343	\$ 11,918	\$ 19,821
<b>55-59</b>	13,671	15,545	18,286	17,037	16,302	14,937	19,750	20,827
<b>60-64</b>	19,550	20,368	21,937	22,794	20,480	21,287	22,042	25,513
<b>65-69</b>	20,037	19,976	22,130	23,077	25,215	25,559	25,378	25,300
<b>70-74</b>	16,680	18,641	17,573	19,187	20,566	21,916	21,803	23,452
<b>75-79</b>	15,926	16,059	18,885	18,592	20,188	19,738	20,529	21,117
<b>80-84</b>	11,083	11,156	12,769	14,805	16,234	17,973	17,782	19,609
<b>85 &amp; over</b>	7,822	9,067	9,285	6,758	12,945	13,855	15,120	15,617
<b>All Ages</b>	15,011	15,699	17,062	17,942	18,994	19,585	20,528	22,113

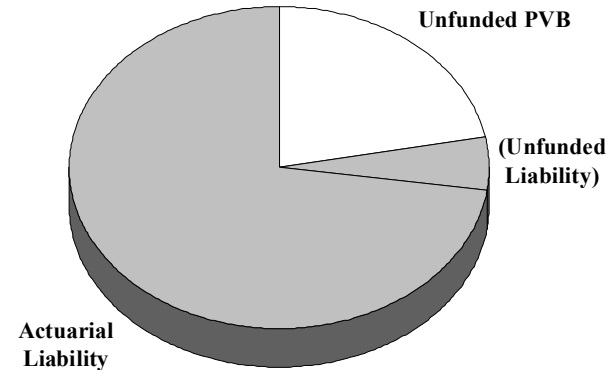


## 2.5% @ 55 Amendment 6/30/2003

**Present Value of Benefits  
Before 2.5% @ 55**



**Present Value of Benefits  
After 2.5% @ 55**



<u><b>Before 2.5% @ 55</b></u>		<u><b>After 2.5% @ 55</b></u>
\$ 122,300,000	<b>Unfunded PVB</b>	\$ 151,100,000
(22,600,000)	<b>(Unfunded Liability)</b>	(37,100,000)
485,700,000	<b>Actuarial Liability</b>	500,200,000
585,300,000	<b>PVB</b>	614,100,000



**2.5% @ 55**  
**Amendment 6/30/2003**

- Present Value of Benefits Increase ≈ \$ 28.8 million
- Actuarial Liability Increase ≈ \$ 14.5 million
- Employer contribution rate increase ≈ 2.4%
  - Normal Cost ≈ 0.8%
  - Prior Cost ≈ 1.6%
  - Asset Method ≈ 0.0%
  - Fresh Start ≈ 0.0%
- Employee contribution rate increase 1.0%

## CalPERS Rate Smoothing

<b>6/30/2008:</b>	<u><b>Unmodified</b></u>	<u><b>Modified</b></u>
<b>Market Value</b>	100.0%	100.0%
<b>Actuarial Value</b>	97.8%	97.8%
<b>6/30/2009:</b>	<u>-24.8%</u>	<u>-24.8%</u>
<b>Market Value</b>	75.2%	75.2%
<b>Actuarial Value:</b>		
<b>1. Project @ 7.75%</b>	105.4%	105.4%
<b>2. Adjust: [(MV-AV) x (1/15)]</b>	103.4%	103.4%
<b>3. Limited by corridor</b> <b>[Unmodified: 120%,</b> <b>Modified: 140%]</b>	90.2%	103.4%
<b>Actuarial Rate of Return</b>	-7.7%	5.7%
<b>Ratio of Actuarial Value to Market Value</b>	120.0%	137.5%



## CalPERS Rate Smoothing

<b>Actuarial Asset Values</b>	<b>Old Method</b>	<b>New Method</b>
● Project Assets forward	7.75%	7.75%
● Asset Gain/Losses Recognized	15 Years	15 Years
● Ratio of Actuarial to Market Value of Assets	80-120%	60-140%
 <b>Actuarial Asset Methods</b>		
● Amortization		
○ Years	30 Years	30 Years
○ Factor	6%	6%
● Minimum	Normal Cost less 30 Year Amortization of Surplus	Normal Cost less 30 Year Amortization of Surplus