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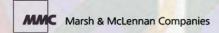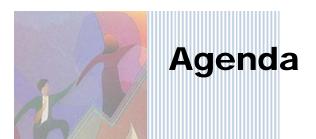
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Oregon PERS
First Steps in Managing Employer Rates:
Actuarial Methods

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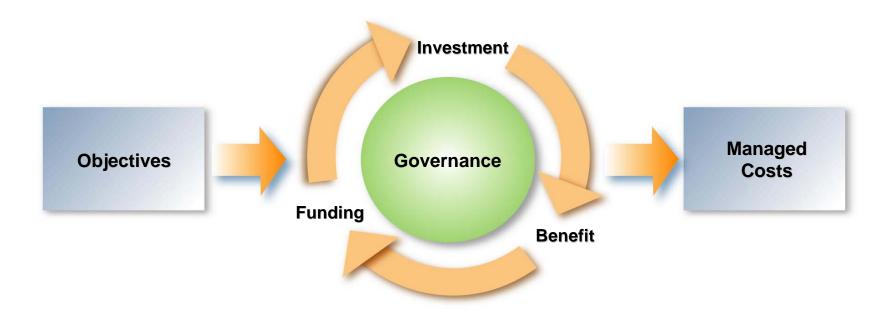Portland, Oregon

Agenda

- Background

  - Current environment

  - Current methods

- Proposed methods for consideration

- What other systems are doing

- Next Steps

Retirement Plan Financial Management Framework

Background
Current Environment

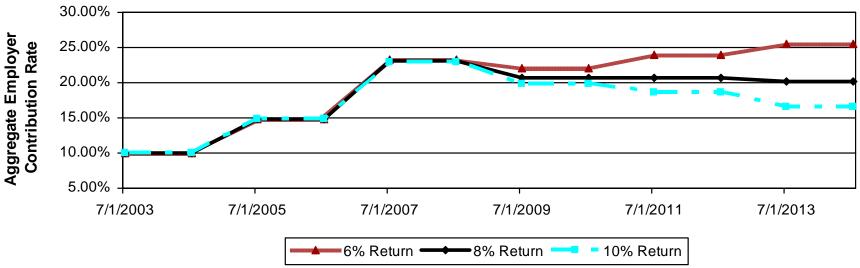| Benefit	Funding	Investment
▪ OPSRP and IAP established for members hired after August 29, 2003 ▪ Member contributions diverted from Tier One/Two to the IAP starting in 2004 ▪ Reform curtailed growth in Money Match benefits ▪ Strunk Ruling provides 8% per year earnings guarantee to Tier 1 member accounts ▪ Employers can incur additional cost due to pick up of member contributions ▪ Actuarial methods do not impact benefits paid	▪ Actual savings due to reform lower than expected due to investment experience and the Strunk Ruling ▪ Post-reform normal cost higher due to redirection of member contributions ▪ Employer contribution rates high ▪ Concerns around volatility of rates ▪ 7/1/05 employer rates phased in to mitigate higher than expected increases ▪ Board would like to evaluate options to mitigate volatility in employer contribution rates	▪ Investment earnings affect assets available to pay benefits ▪ Lack of clarity around how earnings impact employer contribution rates ▪ Investment earnings impact Tier Two Money Match benefits through interest crediting ▪ In the near-term, higher investment returns do not significantly reduce employer rates ▪ In the long-term, investment returns significantly impact employer rates

Context
High Earnings Won't Significantly Reduce Rates Immediately

		2005 Earnings		
		0%	**8%**	**16%**
Payroll Increase	**0%**	27.2%	26.3%	25.6%
	4%	26.6%	25.8%	25.1%

- The rates shown above do not include the 6% IAP contribution or the effect of employer side funds.

- Using reserves reduces these rates by about 2.1%.

- The actual contribution rates effective July 1, 2007 will depend on a number of factors, including changes in methods and assumptions Mercer recommends.

- Two critical factors are investment earnings during 2005 and the total payroll increase of the employer. The investment earnings affect the assets available to pay benefits, and the change in payroll determines how the amortization of the unfunded is spread as a percentage of employee salaries and also influences the liability for active members.

- Asset smoothing and amortization methods spread the impact of changes in payroll and investment earnings over a long period.

Context
Earnings Make a Significant Difference Long-Term
(Using Non-Valuation Reserves)

- The rates shown above do not include the 6% IAP contribution or the effect of employer side funds.

- As part of the 2003 earnings crediting decision, the Board set aside approximately $1.2 billion in the contingency and capital preservation reserves. Staff has recommended the Board set aside an additional $600 million in these reserves out of 2004 earnings. This chart shows the expected contribution rates in the future, using $1.8 billion of non-valuation reserves as of December 31, 2004.

- The funded status of the System is expected to decline from 86% (without side accounts) on December 31, 2003 to about 79% on December 31, 2005. The funded status of the System is expected to decline from 96% (with side accounts) on December 31, 2003 to about 91% on December 31, 2005.

- Over the long run, investment earnings will make a significant difference in contribution rates.

Background
Overview of Measures to Control Contribution Volatility

- Short-Term Measures

  - Use of the Contingency and Capital Preservation Reserves

  - Formal policy on interest crediting

- Intermediate-Term Measures

  - Review use of Entry Age Normal funding method

  - Review alternative methods to smooth contribution rates

  - Review other actuarial methods and assumptions

- Long-Term Measures

  - Financial modeling of reserving policies

  - Asset-liability study to assess the risk-return benefits of different asset allocations

Background
Basic Theory of Employer Contributions

Employer Rate Calculation

Employer Normal Cost	→	Employer Normal Cost
		Amortization

ACCRUED LIABILITY

ACTUARIAL ASSETS

Funded Position as of December 31, YYYY

Contribution as of July 1, YYYY+2

Theoretical Cost Allocation

- The **accrued liability** represents the liability attributable to prior service by the cost method.

- The **normal cost** represents the increase in liability attributable to an additional year of service.

- Different actuarial cost methods use different techniques for allocating costs to periods of service.

Background
Current Actuarial Methods

	Liability	Assets
Method	■ Entry Age Normal (EAN) ■ Spreads cost of annual benefits as a level percentage of pay over the working life of each individual member ■ Effective for final average formula benefits like Full Formula ■ Present value of current and future benefits (PVB) = Accrued liability (AL) + Present value of future normal costs (PVNC)	■ Smoothing method adopted in 2000 to control the volatility of employer rates ■ Smoothes investment gains and losses over four years ■ Smoothed value within 10% of fair value ■ Most public entities use some type of asset smoothing method
Issues	■ Allocates normal cost for Money Match benefit even after redirection to IAP ■ Higher NC implies lower AL as PVB stays the same ■ For the Money Match benefit, the accrued liability is lower than the present value of benefits accrued to date (PVAB)	■ Current funded status is less transparent due to smoothing ■ Does not smooth impact of earnings on liabilities ■ Mismatch between assets and liabilities for Tier One and Tier Two (post-Strunk impact minimal)

Methods for Consideration
Objectives for Actuarial Methods

- Transparent

- Predictable and stable

- Actuarially sound

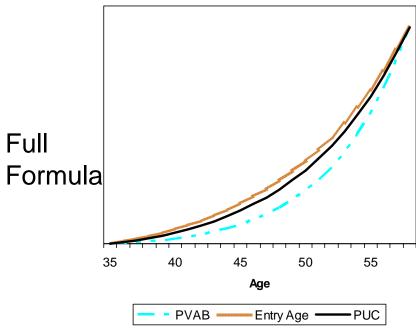- Equitable across generations

- GASB compliant

Methods for Consideration
Actuarial Liability Methods

	Entry Age Normal (EAN)	Projected Unit Credit (PUC)
Normal Cost	■ Spreads cost of annual benefits as a level percentage of pay over the working life of each individual member	■ Calculated for each individual member as cost of additional year of service based on projected pay
Accrued Liability	■ Accumulated value of prior normal costs	■ Based on all prior service and projected pay
Impact	■ Higher normal cost and lower AL	■ Lower normal cost and higher AL
Pros	■ Most common method used by public entities ■ Stable normal cost as a percentage of payroll ■ GASB compliant	■ Accrued liability does not lag behind the value of benefits accrued to date ■ Normal cost accurately reflects the value of benefits earned for additional service ■ GASB compliant
Cons	■ May overstate normal cost when Money Match benefit is more valuable ■ When member terminates, there is an increase in liability.	■ Relatively uncommon for public entities ■ Normal cost for the closed group of Tier One and Tier Two employees will increase as the group gets older ■ 22-year amortization of higher UAL shifts Tier One costs to future generations

Methods for Consideration
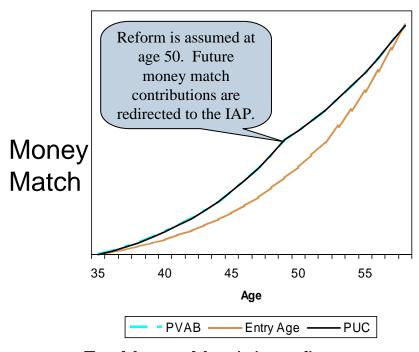## Full Formula and Money Match Benefit Liabilities

Comparison of Accrued Liability

Comparison of Accrued Liability

Full Formula

PVAB — Entry Age — PUC

Money Match

Reform is assumed at age 50. Future money match contributions are redirected to the IAP.

PVAB — Entry Age — PUC

- Present value of accrued benefits to date—PVAB—(based on current service and pay) increases rapidly as member approaches retirement

- Actuarial methods allocate these costs evenly across an employee's career
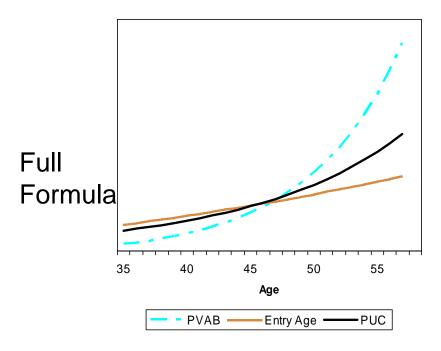
- For Money Match benefit, entry age accrued liability is less than the PVAB

- In this case, projected unit credit (PUC) follows the pattern of benefit accruals exactly, so the PUC accrued liability always equals the value of the accrued benefit

Mercer Human Resource Consulting

Methods for Consideration
Full Formula and Money Match Benefit Normal Cost

Comparison of Normal Cost

Comparison of Normal Cost

Full Formula

Money Match

Reform is assumed at age 50. Future money match contributions are redirected to the IAP.

Age

Age

- - - PVAB ——— Entry Age ——— PUC

- - - PVAB ——— Entry Age ——— PUC
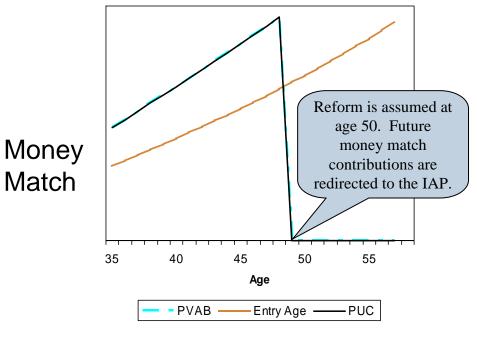
- PVAB normal cost shows the pattern in which benefits are actually earned

- Both Entry Age and PUC allocate normal cost more evenly through career than the PVAB cost by reflecting future pay; Entry Age more so than PUC

- Entry Age normal cost is below the rate at which actual benefits accrue until contributions are re-directed to the IAP; after: significantly higher than the benefit accrual rate

- In this case, projected unit credit follows the pattern of benefit accruals exactly

Methods for Consideration
Effect on 12/31/2003 Values

	PVAB	Normal Cost		Accrued Liability	
		EAN	PUC	EAN	PUC
Actives Tier One					
General Services	$16.1	$0.39	$0.07	$14.9	$16.1
Police & Fire	$ 2.0	$0.07	$0.03	$ 1.7	$ 2.1
Actives Tier Two					
General Services	$ 1.1	$0.25	$0.12	$ 1.0	$ 1.2
Police & Fire	$ 0.2	$0.05	$0.03	$ 0.2	$ 0.3
Judges	$ 0.1	$0.01	$0.01	$ 0.1	$ 0.1
Retirees & Inactives	$28.3	$0.00	$0.00	$28.3	$28.3
Total	**$47.8**	**$0.77**	**$0.26**	**$46.2**	**$48.1**

Calculations as of December 31, 2003 in billions

Methods for Consideration
Effect on 12/31/2003 Values

- Changing to the PUC method results in a lower normal cost and a larger UAL.

- The net effect is a reduction in contribution rate because the UAL amortization extends further into the future than the normal cost for members expected to retire under money match.

- With the increase in the UAL, the funded status of the system declines from 86% to 79% as of December 31, 2003 (without side accounts).

- By amortizing the difference in the UAL due to implementation of the PUC method over seven years the 7/1/05 contribution rate would be 17.6%

	EAN	PUC	PUC over 7 yrs
NC Rate	12.6%	4.2%	4.2%
UAL Rate	7.1%	10.6%	13.4%
Contribution Rate (7/1/2005)	19.7%	14.8%	17.6%
IAP 6% Contribution	6.0%	6.0%	6.0%
Funded Status (without side accounts)	86%	80%	80%
Funded Status (with side accounts)	96%	89%	89%

Methods for Consideration
Smoothing Methods

	Smoothed Assets	**Collar on Contributions**	**Average Contributions**
Method	▪ Investment earnings smoothed over four years ▪ Smoothing limited to within 10% of fair asset value	▪ Uses market value of assets ▪ Smooth contribution rates ▪ Limit annual change in contributions within a specified "collar"	▪ Uses market value of assets ▪ Smooth contribution rates ▪ Average contribution rates over a period of years
Pros	▪ Smoothing assets is the most common approach to smoothing contribution rates ▪ Can be enhanced by increasing smoothing period or removing 10% bracket	▪ Funded status of the system more transparent to stakeholders ▪ Contributions are smoothed rather than assets and liabilities ▪ Helps effectively budget for future contributions	▪ Funded status of the system more transparent to stakeholders ▪ Contributions are smoothed rather than assets and liabilities
Cons	▪ Less transparent ▪ Does not smooth impact of earnings on liabilities	▪ Not prevalent though has been used by some public entities ▪ Slow to adjust to significant changes; funding may lag if extended losses occur ▪ Additional GASB reporting may be required	▪ Not prevalent ▪ Additional GASB reporting may be required

Methods for Consideration
Collar on Contributions Method

Illustration of Collar Method

Legend:
- Prior Rate - 2%
- Prior Rate + 2%
- Calculated Rate
- Rate w/ Collar

- The Board could establish a collar such that the contribution rate cannot increase or decrease by more than a specified percentage of payroll in any year. The example uses 2% of payroll.

- Provides a firm number for budgeting early in the process. For example, when the December 31, 2004 interim valuation is complete, employers would know the maximum and minimum rates effective July 1, 2007.

- This method can be slow to adjust to significant changes, so an exception may need to be made if the funding level drops below or exceeds a certain level.

Methods for Consideration
"Average Contributions" Method

- The Board could set rates based on the average calculated rate over the last 5 years. The calculated rate is based on the current value of assets and the current actuarial cost method.

- This method smoothes contribution rates, but is more sensitive than the collar method to sudden changes in assets or liabilities.

- This method does not set an absolute minimum and maximum for budgeting purposes, but narrows the range since the last valuation will only provide one-fifth of the rate.
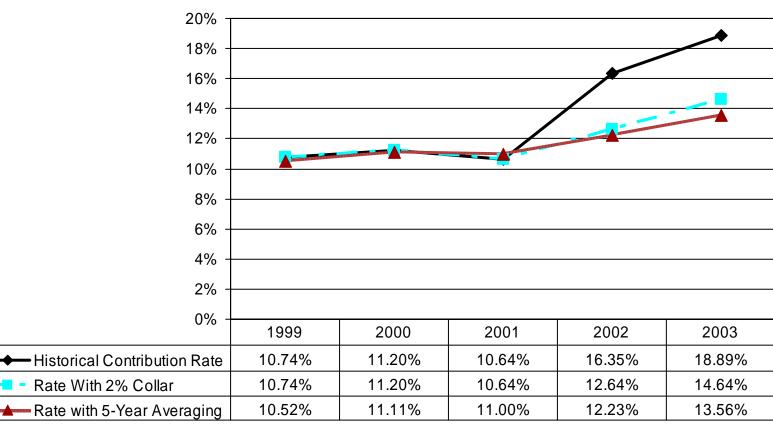
Illustration of Averaging Method	
Calculated Rates*	
12/31/1999	10.74%
12/31/2000	11.20%
12/31/2001	10.64%
12/31/2002	16.35%
12/31/2003	18.89%
Average Rate	**13.56%**

*The rates shown were calculated using a smoothed value of assets instead of a market value of assets.

Methods for Consideration
Smooth Contribution Rates—Historical Illustration

	1999	2000	2001	2002	2003
Historical Contribution Rate	10.74%	11.20%	10.64%	16.35%	18.89%
Rate With 2% Collar	10.74%	11.20%	10.64%	12.64%	14.64%
Rate with 5-Year Averaging	10.52%	11.11%	11.00%	12.23%	13.56%

What Other Systems Are Doing

Cost Method

- Most public sector systems use the Entry Age Normal cost method.

- Projected Unit Credit cost method is common in the private sector because this method is required for accounting disclosures.

Asset Smoothing

- Most public sector systems smooth assets.

- Most private sector plans also smooth assets.

Prevalence of Cost Method*	
Entry Age Normal	72%
Projected Unit Credit	13%
Aggregate	12%
Frozen Entry Age	3%

Prevalence of Asset Smoothing*	
Smoothed Value	93%
Market Value	7%

2004 Wilshire Report on State Retirement Systems: Funding Levels and Asset Allocation

What Other Systems Are Doing

Smooth Contribution Rates	Recent System Actions
■ Most systems do not smooth contribution rates directly.	■ Arizona
	– Removed requirement that actuarial assets be within 20% of market value
■ Some contribution rates are set by statute, and are only changed by changing the statute.	– Extended smoothing period from 5 to 10 years
	■ CalPERS
■ Some statutes set a collar around changes in contribution rates. Some of these plans have struggled with funding if the collar is too tight because if the rate gets too far behind it is difficult to catch up.	– Adopted a 15-year asset smoothing method
	– Changed UAL amortization to a 30-year rolling average
	– Established a minimum contribution rate
■ Some contribution rates are tied to specific revenue sources.	■ Many Systems
	– Pension obligation bonds

Next Steps

- **Seek stakeholder input** – These suggestions alter the pattern of contributions, but not the total cost of the system. Some alternatives may require additional accounting. It may be worthwhile to get some input from stakeholders regarding the various tradeoffs between transparency and stability.

- **Financial modeling** – Different alternatives may have different impacts on funded status and contribution rates. The Board may wish to explore these alternatives using the financial model before making a final decision.