MERCER

Human Resource Consulting

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Oregon Public Employees Retirement System

Experience Study for December 31, 2006 Valuation
Tier 1/Tier 2 and OPSRP

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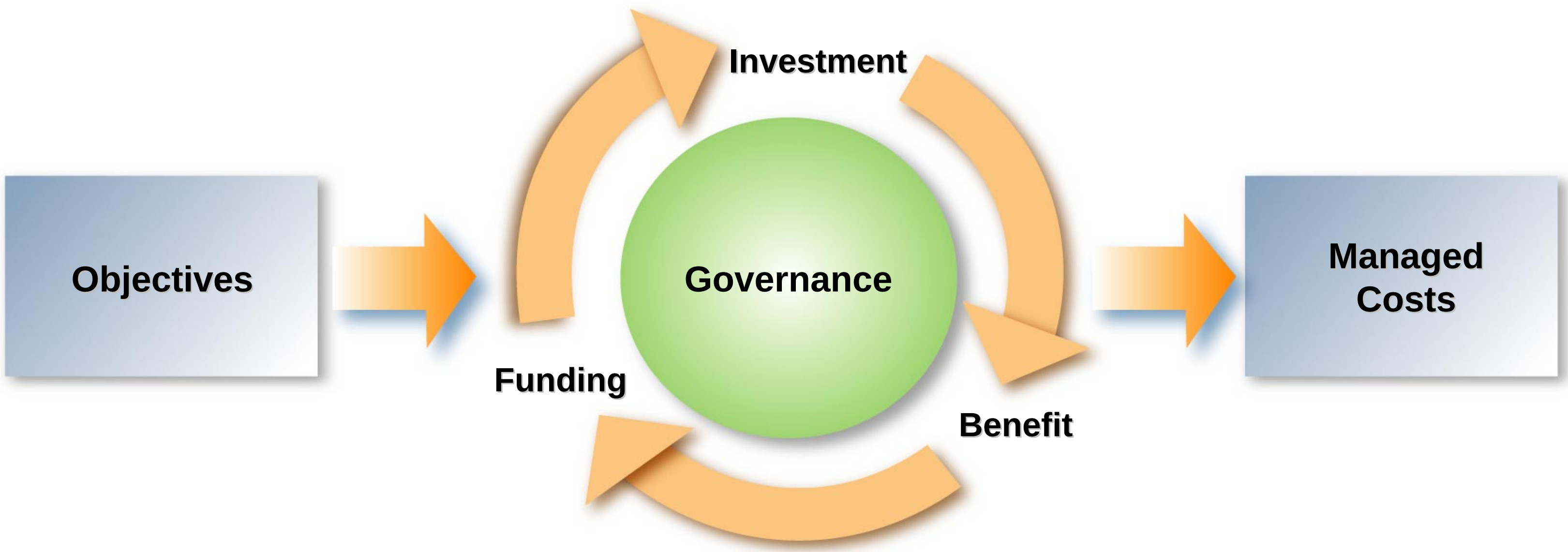
MMC Marsh & McLennan Companies

Contents

Introduction
Retirement Plan Financial Management Framework

Total Contributions = Benefits Paid - Investment Earnings



Actuarial methods/assumptions primarily affect the timing of contributions

Introduction
Objectives for Actuarial Methods and Assumptions

- Transparent
- Predictable and stable rates
- Protect funded status
- Equitable across generations
- Actuarially sound
- GASB compliant

Introduction
Summary of Recommendations

- Actuarial Methods and Allocation Procedures
  - Eliminate 18-month delay rate adjustment
  - Exclude retiree healthcare from the collar calculation
  - Revise allocation of liability for service segments
- Economic Assumptions
  - Increase OPSRP administrative expense assumption
- Demographic Assumptions
  - Adjustment to some retirement rate assumptions
  - Reduction in total lump sum at retirement assumption
  - Reduction of duty disability incidence assumptions
  - Minor adjustments to termination rate assumptions
  - Reduction in percentage electing a withdrawal prior to retirement

Actuarial Methods and Allocation Procedures

Tier 1/Tier 2 and OPSRP

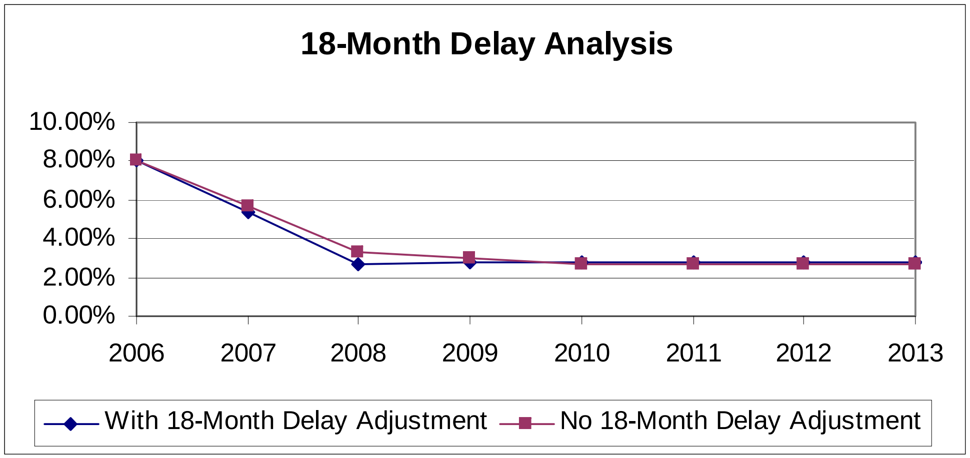
Actuarial Methods
Summary of Recommendations

	Current Assumptions	Recommended Changes
Actuarial Cost Method	Projected Unit Credit	None
Amortization Method	Level Percent of Combined Payroll	None
Amortization Period	▪ T1/T2 12/31/2006 UAL – 21 years ▪ T1/T2 PUC Method change – 3-year rolling ▪ Future experience – 20 years (T1/T2) or 16 years (OPSRP) from first valuation used to set contribution rates in which experience is recognized	None
Asset Valuation Method	Market Value	None
Excluded Reserves	Contingency, Capital Preservation, and Rate Guarantee	None
Rate Collar	Greater of 20% of current rate or 3 percentage points. Rate collar doubles if funded percentage falls below 80% or increases above 120%	Same as current, but exclude RHIA and RHIPA from the collar
18-Month Delay	Adjust contribution rate such that when combined with the current rate, it has the same present value as the contribution rate on the valuation date over the amortization period.	Eliminate adjustment

Actuarial Methods
Rate Collar

- The rate collar is used to control the volatility of employer contribution rates from one valuation to the next.
- In prior years we have included the RHIA and RHIPA rates within the rate collar calculation, but we now recommend excluding them.
  - RHIA and RHIPA assets must be maintained strictly separate from the pension assets.
  - RHIA and RHIPA are now reported under GASB 43 and 45.
  - RHIA and RHIPA contribution rates are relatively small, so they do not need the smoothing provided by the collar.
  - Eliminates one complication from the collar calculation.

Actuarial Methods
18-Month Delay Rate Adjustment



The chart shows an example where the current rate is 8.0% and the rate calculated as of the valuation date is 3.0%. The difference of 500 basis points creates a relatively extreme situation for the 18-month delay. A less extreme example would show even less difference.

- This procedure is used to adjust employer contribution rates from the valuation date to the date the rate actually becomes effective 18 months later.
- The basis of the adjustment is such that the present value of expected contributions is identical over the length of the amortization period.
- The confusion created by having a different rate as of the valuation date than the effective date is significant.
- The additional accuracy gained from this adjustment is not significant.
- We recommend eliminating the 18-month delay rate adjustment.

Allocation Procedures
Allocation of Liability for Service Segments

- When a member works for more than one employer over their career, the liability for that member is allocated to the employers for which the member worked.
- Current method
  - In proportion to the member's account balance attributable to each employer.
  - Methodology matches that used by PERS if the member retires under Money Match.
- Issues
  - No liability is allocated to employers for service after 12/31/2003
  - Doesn't correspond to the methodology used by PERS for Full Formula retirements
- Recommendation
  - Blend Money Match and Full Formula methodologies based on percentage of liability attributable to each formula as of the next rate setting valuation.

Percentage of Liability Projected to be Attributable to Money Match		
	General Service	Police & Fire
December 31, 2007	64%	23%
Recommendation	65%	25%

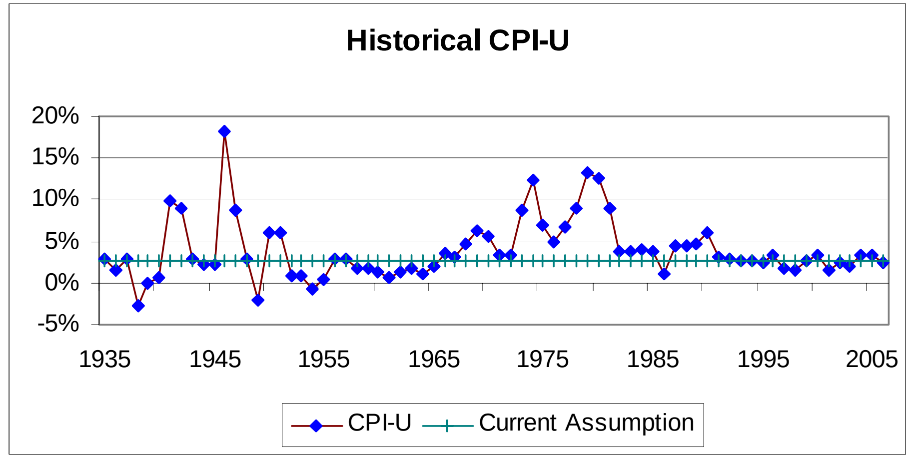
Economic Assumptions

Economic Assumptions
Summary of Recommendations

	Current Assumption	Recommended Assumption
Inflation	2.75%	No change
Real Wage Growth	1.00%	No change
Payroll Growth	3.75%	No change
Regular Investment Return	8.00%	No change
Variable Investment Return	8.50%	No change
Health Cost Trend Rate		
▪ 2008 Trend Rate	8.00%	No change
▪ Ultimate Trend Rate	5.00%	No change
▪ Year Reaching Ultimate Trend	2013	No change
OPSRP Administrative Expenses	$6.7 million	$8.5 million

Economic Assumptions
Inflation

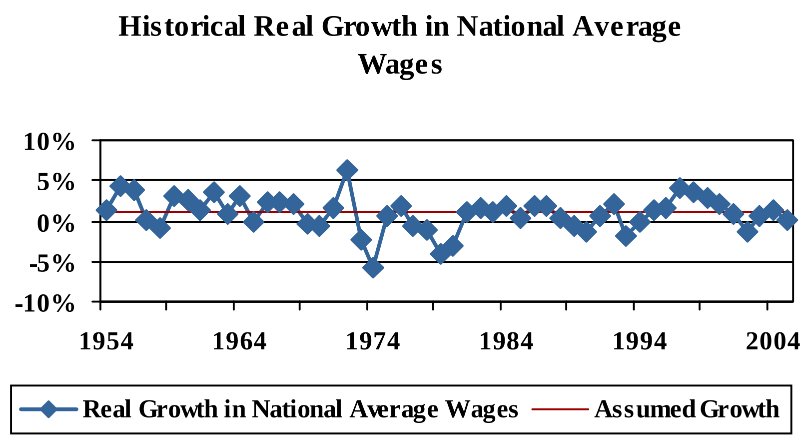
- The inflation assumption affects other assumptions, including payroll growth, investment return, and health care inflation
- Historical rates have varied significantly as shown in the chart on the top. The median rate over this period is 2.99%.
- Market estimates of future inflation rates can be estimated from the difference in yield between nominal Treasury securities and Treasury inflation protection securities (TIPS)
- Social Security's current intermediate inflation assumption is 2.8%.
- We recommend no change to the current assumption of 2.75%.



As of 12/31/2006	10-Year	30-Year
Treasury Yield	4.71%	4.81%
TIPS Yield	2.35%	2.37%
Breakeven Inflation	**2.36%**	**2.44%**

Economic Assumptions
Real Wage Growth

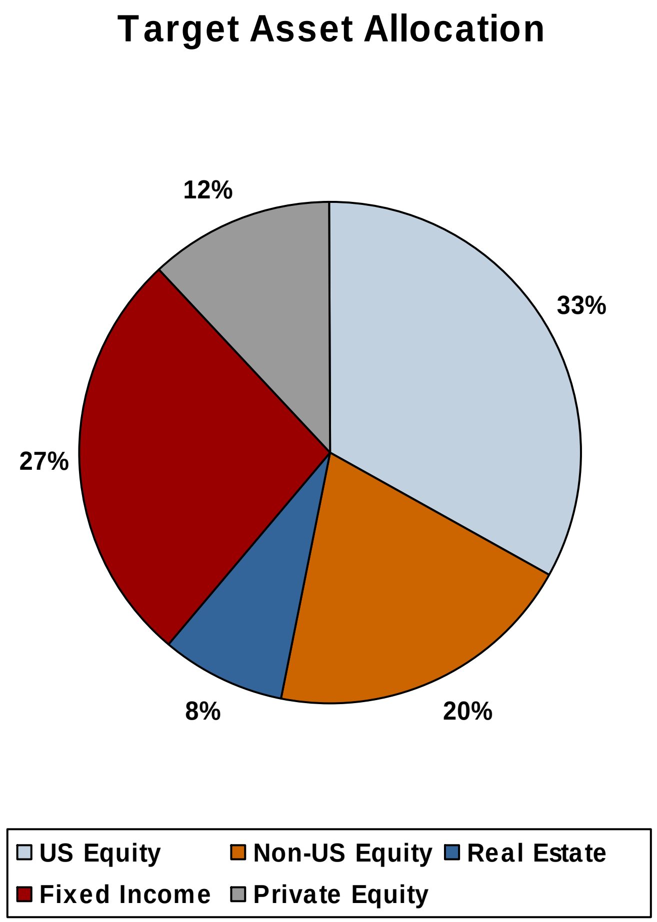
- An individual member's expected salary increase is composed of three components:
  - Inflation
  - Real wage growth
  - Merit and longevity wage growth
- Real wage growth represents the increase in wages above inflation for the entire group due to improvements in productivity and competitive pressures
- Social Security's intermediate assumption for real wage growth is 1.1%
- We recommend maintaining this assumption at 1.0%
- Combined with our recommended inflation assumption, the payroll growth assumption would remain at 3.75%.



Period Ending December 31, 2005	Average Real Growth Rate National Average Wages
10 Years	1.55%
20 Years	1.00%
30 Years	0.63%
40 Years	0.62%
50 Years	0.85%

Economic Assumptions
Investment Return

- The target asset allocation is established by the Oregon Investment Council (OIC).
- Based on capital market forecasts developed by OIC's investment consultant, Strategic Investment Solutions, Inc., and the OIC's expectation of annual active management returns, the OIC expects to earn a total expected annual policy return of 8.7% for the regular account and 9.1% for the variable account.
- These expectations assume 60 and 50 basis points in active management return net of fees for the regular and variable accounts respectively.



Economic Assumptions
Investment Return

Asset Class	Regular Account Target	Regular Account Compound Annual Return	Regular Account Standard Deviation	Variable Account Target	Variable Account Compound Annual Return	Variable Account Standard Deviation
US Equity – Large Cap	29%	8.05%	18.0%	89%	8.05%	18.0%
US Equity – Small Cap	4%	8.39%	24.0%	11%	8.39%	24.0%
Private Equity	12%	9.44%	26.6%			26.6%
Non-US Equity	20%	8.36%	19.2%			19.2%
US Fixed Income	24%	5.13%	6.0%			6.0%
Non-US Hedged Bonds	3%	5.13%	6.0%			6.0%
Real Estate	8%	7.18%	13.7%			13.7%
Portfolio -- Gross	100%	8.07%	12.3%	100%	8.16%	18.3%
Portfolio – Net of Expenses		**7.82%**	**12.3%**		**7.90%**	**18.3%**

Based on capital market expectations developed by Mercer Investment Consulting

Economic Assumptions
Investment Return

Percentile	Regular Account	Variable Account
35th	6.76%	6.32%
40th	7.12%	6.86%
45th	7.47%	7.39%
50th	7.82%	7.90%
55th	8.17%	8.42%
60th	8.52%	8.94%
65th	8.88%	9.48%

- Using Mercer Investment Consulting assumptions the median expected return is 7.82% for the Regular and 7.90% for the Variable account both net of expenses and before active management.
- We assumed 5 basis points in administrative expenses and 20 basis points in passive investment expenses.
- The OIC expected annual policy return is 8.1% for the Regular and 8.6% for the Variable account before active management
- We recommend no change to the 8.0% investment return assumption for the Regular account or the 8.5% investment return assumption for the Variable account.

Economic Assumptions
OPSRP Administrative Expenses

- OPSRP administrative expenses are significant relative to OPSRP assets.
  - 7/05 – 12/05 = $2.2 million ($4.4 million per year)
  - 2006 = $5.3 million
  - 1/07 – 6/07 = $2.8 million ($5.6 million per year)
  - IT start-up charges = $1.9 million per year through 2009 (not included above)
- To anticipate some continued growth in administrative expenses, we recommend an assumption of $8.5 million per year be added to the OPSRP normal cost (current assumption is $6.7M)
  - $6.6 million in regular expenses (current assumption of $4.8M)
  - $1.9 million in IT start-up charges until 2009 (no change recommended)
- We expect the administrative expenses to decline to around 10 basis points in about 10 years and ultimately be similar to the Tier 1/Tier 2 assumption of 5 basis points

	Current		Recommended	
Valuation Year	$ Amount	% of Projected Payroll	$ Amount	% of Projected Payroll
2005	$6.7	0.98%	N/A	N/A
2006	$6.7	0.65%	$8.5	0.82%
2007	$6.7	0.48%	$8.5	0.60%

Economic Assumptions
Health Cost Trend Rate for RHIPA Subsidy

- The Maximum Subsidy increased an average of 6.9% over the last 4 years
- The Maximum Subsidy increased 7.5% in 2006 and decreased 3.1% in 2007
- Mercer’s healthcare actuaries expect medical costs to increase 7-13% in 2007
- We recommend no change to the trend assumption

Health Cost Inflation		
	Current Assumption	**Recommended Assumption**
2007	9.0%	No change
2008	8.0%	No change
2009	7.0%	No change
2010	6.5%	No change
2011	6.0%	No change
2012	5.5%	No change
2013 and later	5.0%	No change

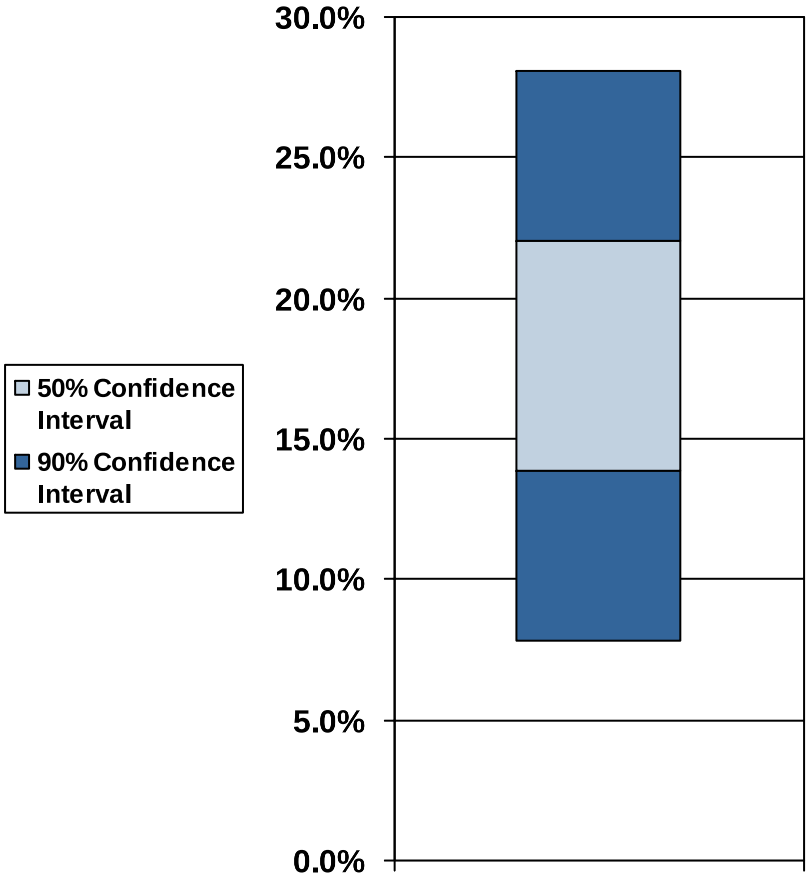
Demographic Assumptions

Demographic Assumptions
Overview

- Compared actual experience from January 1, 2003 through December 31, 2006 to expected experience based on assumptions from the December 31, 2005 actuarial valuation.
- Actual experience, combined with future expectations, are used to develop recommended assumptions for December 31, 2006 actuarial valuation.
- This presentation summarizes those results, primarily for assumptions where changes are recommended.
- More details are provided in the full report.

Introduction
Confidence Intervals

- We have used 50% and 90% confidence intervals in our analysis.
- The 90% confidence interval represents the range around the observed rate that contains the true rate during the period of study with 90% probability
- The size of the confidence interval depends on the number of observations
- If an assumption is outside the 90% confidence interval and there is no other information to explain the observed experience, a change in assumption should be considered.



Demographic Assumptions
Overview

- We are recommending the following changes:
  - Adjustment to some retirement rate assumptions
  - Reduction in total lump sum at retirement assumption
  - Reduction of duty disability incidence assumptions
  - Minor smoothing adjustments to termination rate assumptions
  - Reduction in percentage electing a lump sum prior to retirement

Mortality Assumptions
Healthy Retired

			Current Assumption		
	Exposures	Actual Deaths	Expected Deaths	A/E Ratio	Recommendation
School District Male	57,508	1,597	1,449	110%	No change
School District Female	108,622	2,626	2,420	109%	No change
Other General Service Male	83,679	2,629	2,477	106%	No change
Police & Fire Male	18,662	311	295	105%	No change
Other Female	102,882	3,119	2,740	114%	No change
Disabled Male	8,276	344	321	107%	No change
Disabled Female	8,589	329	323	102%	No change

- The Actual/Expected ratio for healthy retirees should be approximately 110% in order to anticipate mortality improvement in the future.
- No changes are recommended.

Mortality Assumptions
Non-Retired

			Current Assumption		
	Exposures	Actual Deaths	Expected Deaths	A/E Ratio	Recommendation
School District Male	95,965	109	110	99%	No change
School District Female	267,814	142	168	85%	No change
Other General Service Male	207,181	254	279	91%	No change
Police & Fire Male	48,362	38	50	76%	No change
Other Female	300,716	245	246	100%	No change

- This analysis is based on active employees under age 70.
- The Actual/Expected ratio should be close to or below 100% to provide for some conservatism in the valuation.
- No changes are recommended.

Mortality Assumptions
Summary of Assumptions

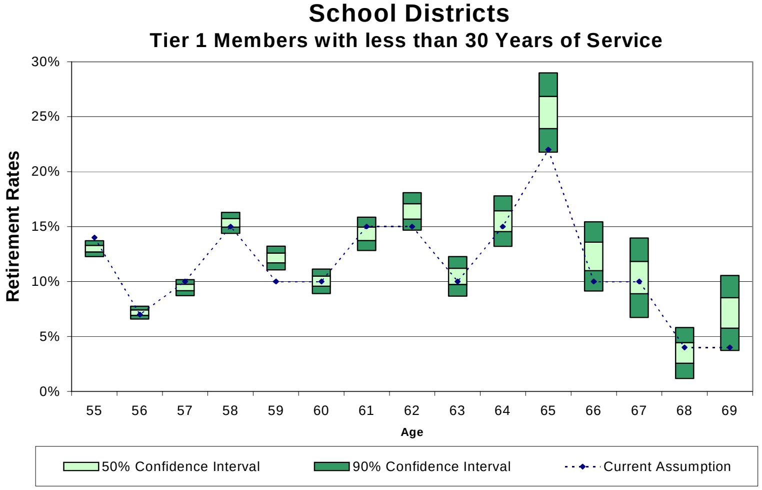
	Current Assumption
Healthy Retired	RP 2000, Combined Active/Healthy Retired, No Collar, Sex distinct
▪ School district male ▪ Other GS male ▪ P&F male	Set back 36 months Set back 24 months Set back 12 months
▪ School district female ▪ Other female	Set back 36 months Set back 18 months
Disabled Retired	RP 2000, Combined Active/Healthy Retired, No Collar, Sex distinct
▪ Male ▪ Female	Set forward 36 months, min of 2.50% Set forward 36 months, min of 2.75%
Non-Retired Mortality	% of Healthy Retired Mortality
▪ School district male ▪ Other GS male ▪ P&F male	65% 65% 70%
▪ School district female ▪ Other female	50% 55%

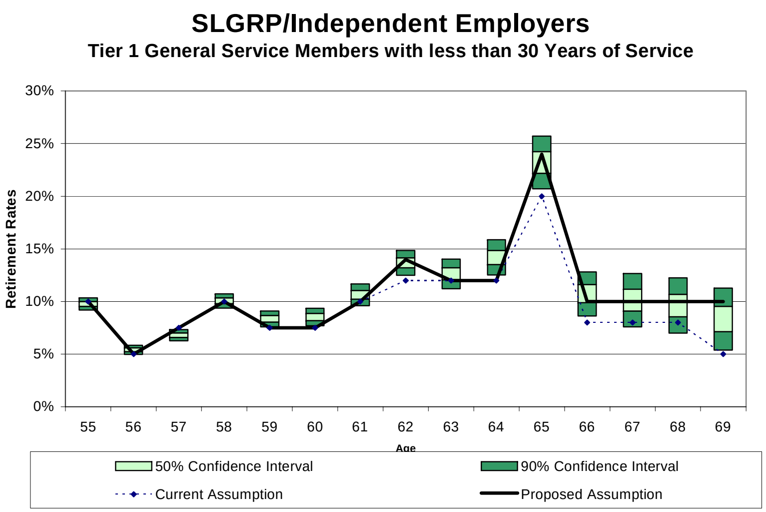
Retirement Assumptions
Retirement from Active Status

- Experience prior to 2004 appears anomalous, so we are just settling in to post-reform retirement patterns.
- As a result, we are recommending some changes to the retirement rate assumptions adopted last year.

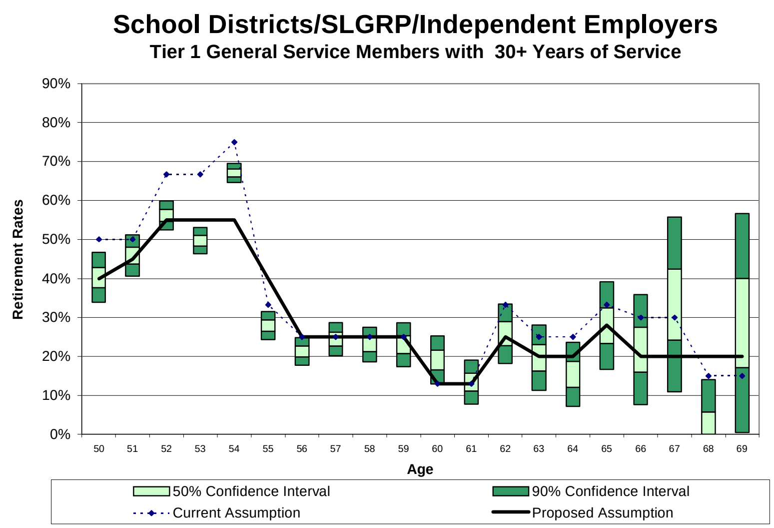
Employment Category	Tier	Normal Retirement Age	Early Retirement Age	Unreduced Retirement
General Service	1	58	55	30 years
General Service	2	60	55	30 years
General Service	OPSRP	65	55	Age 58 with 30 years
Police & Fire	1 and 2	55	50	30 years or age 50 with 25 years
Police & Fire	OPSRP	60	50	Age 53 with 25 years

Retirement Assumptions
Tier 1 General Service

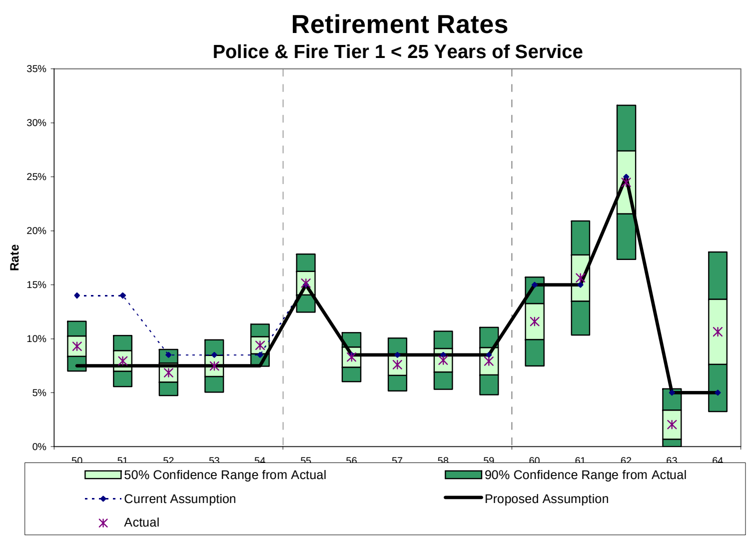


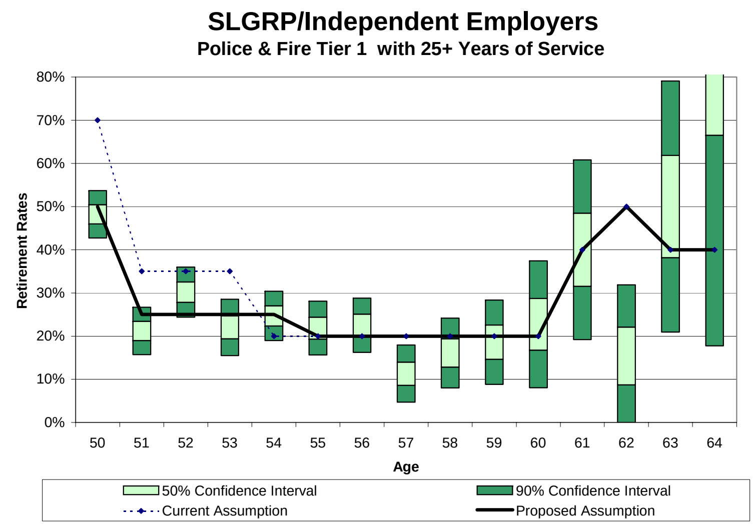


- School District experience continues to follow the assumed rates, so no changes are recommended
- For SLGRP and Independent Employers, we recommend some minor increases in retirement rates at ages 62 and 65 through 69.
- For members with over 30 years of service, we recommend some minor decreases in retirement rates



Retirement Assumptions
Tier 1 Police & Fire





- For Police & Fire members, we recommend reducing the assumed retirement rates for ages prior to 55.

Retirement Assumptions
Retirement from Active Status – Tier 2 and OPSRP

	Recommended Tier 2/OPSRP Assumption
Tier 2 General Service < 30 years	50% of Tier 1 < 30 rates for ages 55-59 with no spike at age 58; 100% of Tier 1 < 30 rates thereafter
Tier 2 General Service 30+ Years	Same as Tier 1 General Service rates for 30+ years of service
Tier 2 Police & Fire	Same as Tier 1 Police & Fire
OPSRP General Service < 30 years	50% of Tier 1 GS < 30 rates for ages 55-59 with no spike at age 58, 100% of Tier 1 GS < 30 rates thereafter, except for no spike at age 58, and including a spike at age 65 (NRA)
OPSRP General Service 30+ Years	Ages 55-57 are the same as OPSRP GS < 30 rates, age 58 is 40%, ages 59+ are the same as the T1/T2 GS > 30 rates
OPSRP Police & Fire < 25 years	50% of T1/T2 PF < 25 rates for ages 50-59, 100% of T1/T2 PF < 25 rates thereafter, except for no spike at age 55, and including a spike at age 60 (NRA)
OPSRP Police & Fire 25+ years	Ages 50-52 are equal to T1/T2 PF <25 rates, 50% at age 53, and ages 54+ are the same as T1/T2 PF > 25 rates

Retirement Assumptions
Lump Sum Option at Retirement

- When a member elects a partial lump sum at retirement, they receive their account balance and a reduced annuity.
- When a member elects a total lump sum at retirement, they receive two times their account balance.
- In both cases, the member gives up the value of the COLA on the portion of the annuity they receive in a lump sum.
- If the member's benefit would be under Full Formula, electing a total lump sum may cause the member to give up significantly more.
- Consequently, we recommend phasing out the total lump sum assumption over a period of time reflecting the transition from Money Match to Full Formula benefits.

Lump Sum Election	Count	Actual %	Current Assumption
Partial	1,280	7%	8%
Total	1,386	7%	8%
None	16,996	86%	84%
Total	19,662	100%	100%

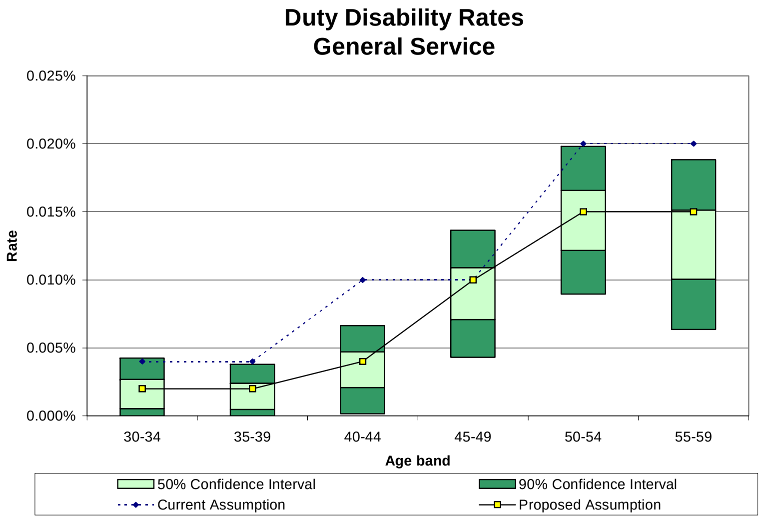
Lump Sum Election	Recommended Assumption
Partial	7% for all years
Total	7% for 2007, declining by 0.5% per year until reaching 0.0%
None	86% in 2007, increasing by 0.5% per year until reaching 93.0%

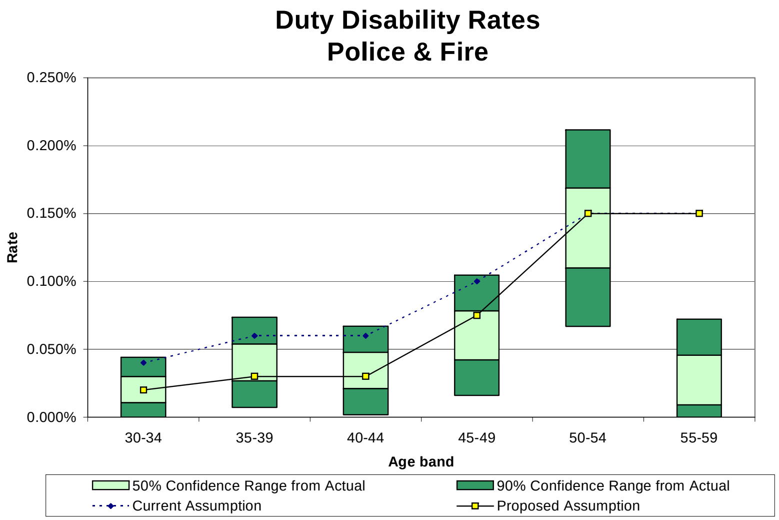
Retirement Assumptions
Purchase of Credited Service

- For Money Match retirements, purchasing service credits is roughly cost neutral to the system, so no assumption is recommended for Money Match benefits.
- No change is recommended for non-money match retirement benefits.

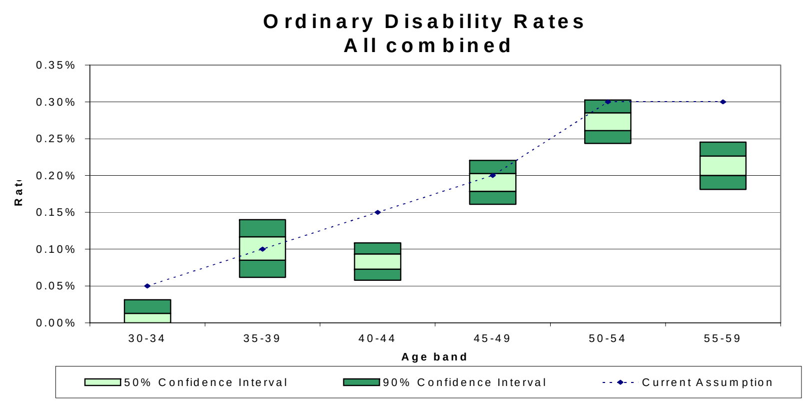
	Count	Number Electing to Purchase Service	Actual %	Current Assumption
Money Match Retirements	10,375	3,656	35%	0%
Non-Money Match Retirements	5,698	2,405	42%	45%

Disability Assumptions
Duty Disability



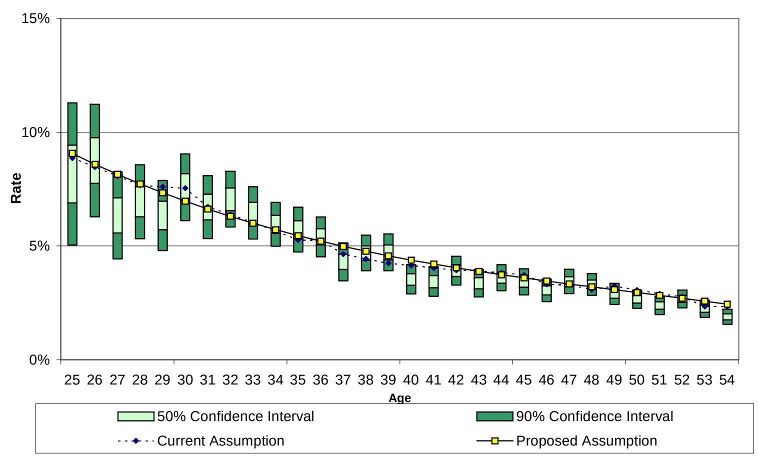


- In the prior study, we reduced duty disability rates some.
- Duty disability rates have declined further since the prior study.
- Consequently, we recommend reductions in duty disability incidence rates at most ages.
- We recommend no changes in ordinary disability rates.

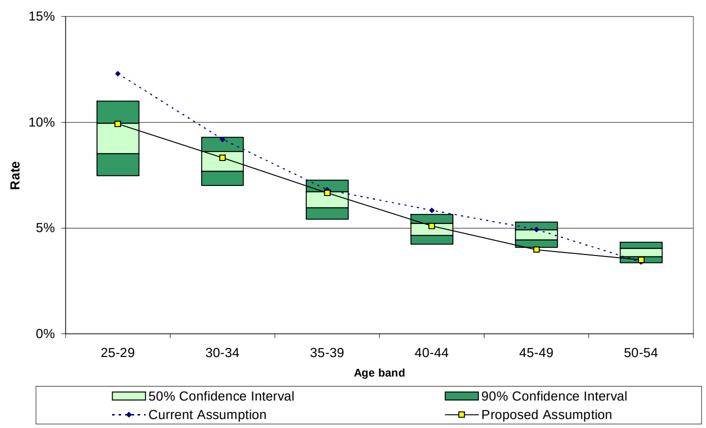


Termination Assumptions
Termination Rates

SLGRP General Service Male



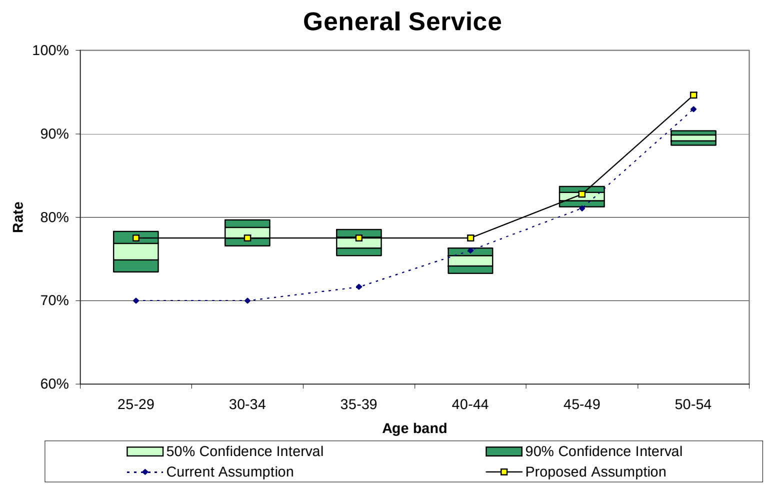
Independent Employers - GS - Female

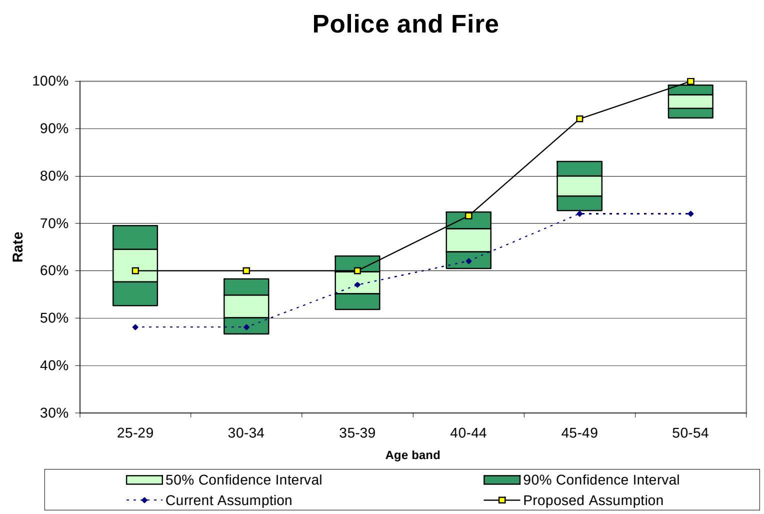


- In our prior study, we re-grouped many of the termination assumptions to better fit the experience.
- In this study, we are smoothing many of those assumptions to remove some anomalies where rates would briefly increase with increasing age.
- The graph of SLGRP general service males is an example of this type of change. Other graphs are in the full report.
- For female general service members of independent employers, we recommend a reduction in rates to better fit the observed experience.

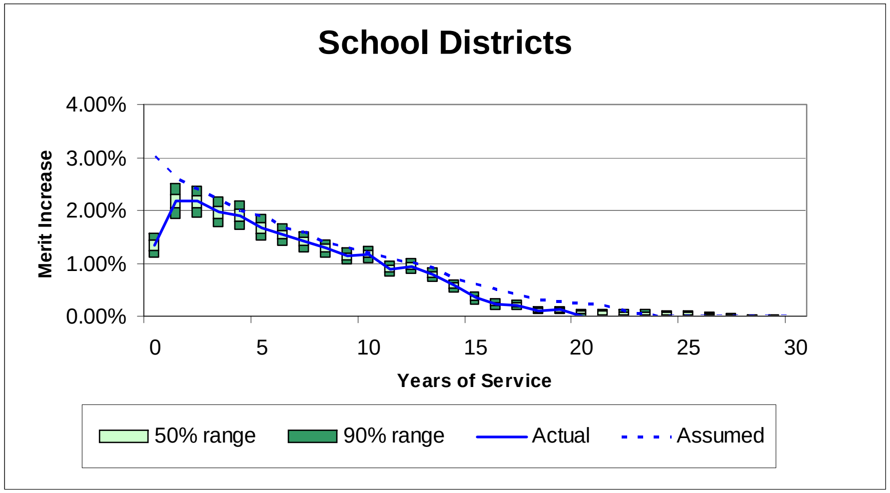
Termination Assumptions
No Withdrawal Before Retirement

- This assumption represents the probability that a terminated member will leave his/her account balance in the plan until retirement.
- Since the prior study, probabilities have increased for both general service and police and fire members.
- We recommend increasing the assumption at all ages.

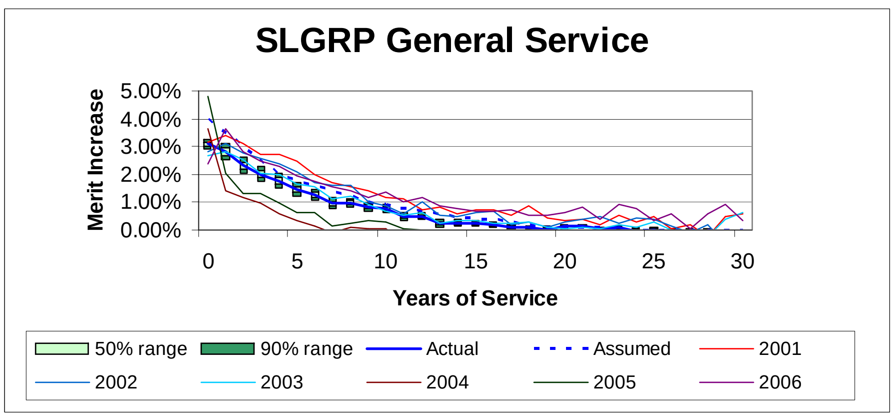


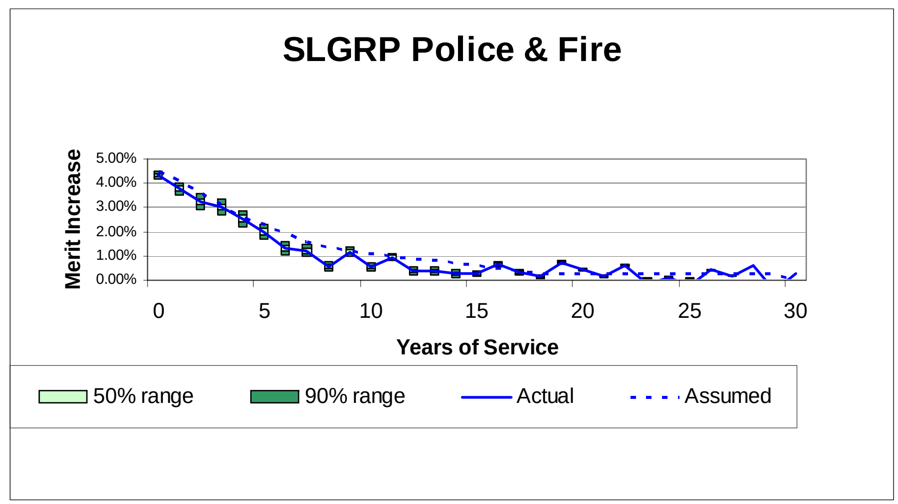


Salary Increase Assumption
Merit Scale



- Actual experience has followed our assumptions reasonably closely, so we are not recommending any changes to the merit scale assumptions.
- Additional graphs are in the full report.





Salary Increase Assumptions
Unused Sick Leave

	Current	Actual	Recommended
State GS Male	5.75%	5.91%	No change
State GS Female	4.75%	4.77%	No change
School District Male	7.25%	7.28%	No change
School District Female	6.75%	6.32%	No change
Local GS Male	3.50%	3.47%	No change
Local GS Female	3.00%	2.98%	No change
State P&F	8.75%	9.29%	No change
Local P&F	8.75%	8.13%	No change
Dormants	3.50%	3.08%	No change

- This assumption represents the percentage increase in a member's final average pay due to cash out of the unused sick leave.
- This assumption is only applied to employers who participate in the Unused Sick Leave Program
- We recommend no changes to these rates.

Retiree Healthcare Assumptions
Participation Rates

	Current Assumption	Actual %	Recommendation
RHIA – Healthy	50%	48%	No change
RHIA – Disabled	25%	24%	No change
RHIPA	11%	9%	No change

- In the prior study, we significantly reduced assumed participation rates.
- This study shows that those reduced rates are still conservative, but reasonably accurate, assumptions.
- We recommend no changes to these assumptions.

Decisions
(Selection of Actuarial Methods and Assumptions)

Decisions
Estimated Impact of Assumption Changes

Estimated Impact of Assumption Changes

	Tier 1/Tier 2			OPSRP	
	Normal Cost Rate	UAL Rate	Employer Contribution Rate	General Service Rate	Police & Fire Rate
Retirement Rates	-0.02%	-0.02%	-0.04%	0.16%	0.01%
Lump Sum Election at Retirement	0.22%	0.17%	0.39%	N/A	N/A
Lump Sum Before Retirement	0.01%	0.03%	0.04%	N/A	N/A
Administrative Expenses	0.00%	0.00%	0.00%	0.17%	0.17%
Other	0.00%	0.00%	0.00%	0.01%	-0.01%
Total	**0.21%**	**0.18%**	**0.39%**	**0.34%**	**0.17%**

Decisions
Selection of Actuarial Methods and Assumptions

- Actuarial Methods and Allocation Procedures
  - Eliminate 18-month delay
  - Exclude retiree healthcare from the collar calculation
  - Revise allocation of liability for service segments
- Economic Assumptions
  - Increase OPSRP administrative expense assumption
- Demographic Assumptions
  - Adjustment to some retirement rate assumptions
  - Reduction in total lump sum at retirement assumption
  - Reduction of duty disability incidence assumptions
  - Minor adjustments to termination rate assumptions
  - Reduction in percentage electing a lump sum prior to retirement

Next Steps

- July Board Meeting – Experience Study
  - Board Adoption of Methods and Assumptions for 12/31/2006 Actuarial Valuation
- Data for 12/31/2006 Actuarial Valuation
  - Received this week
- September Board Meeting – 12/31/2006 system-wide valuation results
- October – 12/31/2006 Individual Employer Reports

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