



July 29, 2011

Oregon Public Employees' Retirement System
Experience Study for December 31, 2010 and
December 31, 2011 Actuarial Valuations

- Demographic Assumptions
- Investment Return Assumptions

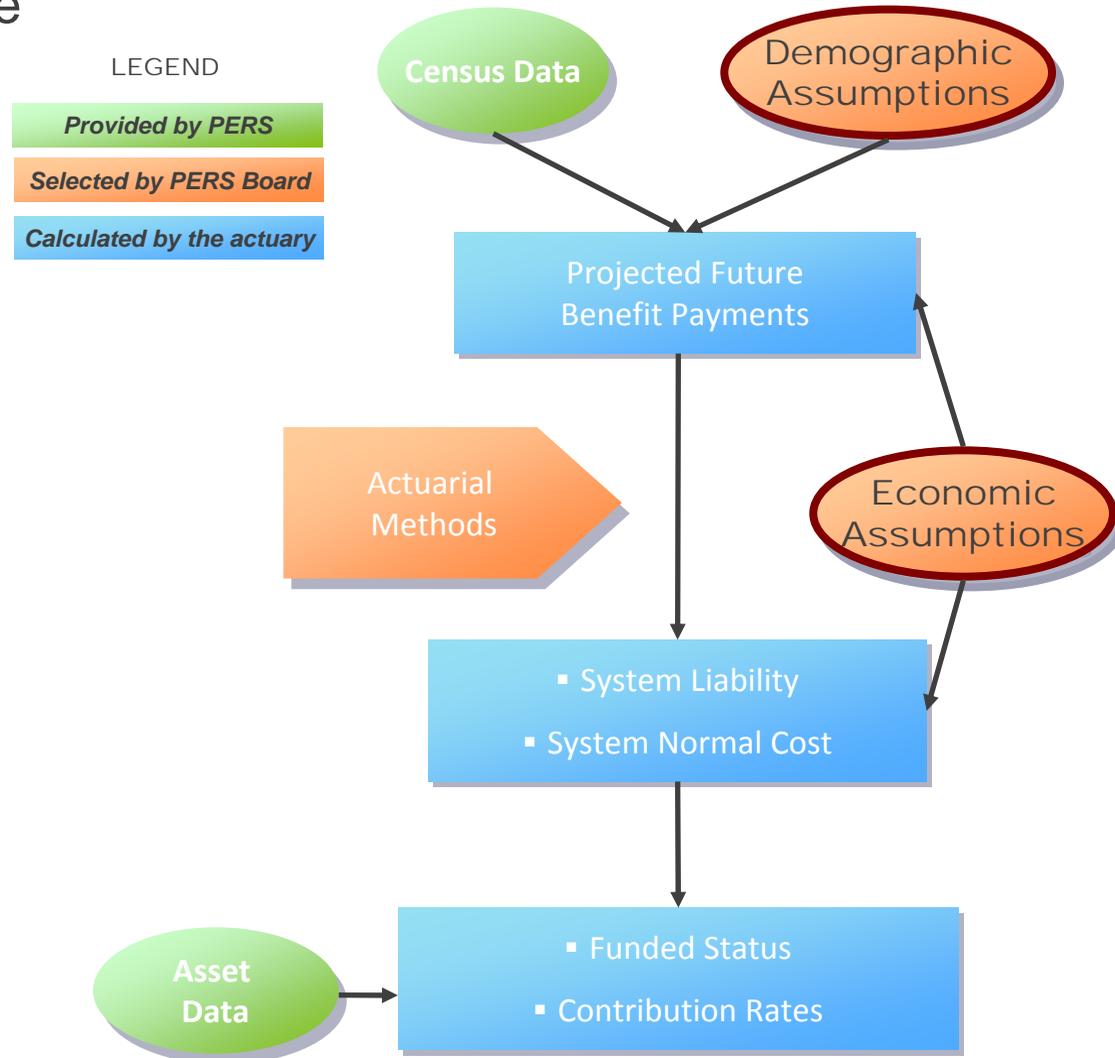
Matt Larrabee and Scott Preppernau

Introduction

Valuation Process and Timeline

PERS Board Actuarial Schedule

- May: Actuarial methods and economic assumptions
- **July: Demographic assumptions and investment return**
- September: System-wide 12/31/2010 funding results and advisory contribution rates and 2012-2013 actuarial equivalence factors
- November: Distribution of employer-specific advisory 2013-2015 contribution rates



Introduction

Valuation Process and Timeline

- Actuarial valuations are conducted annually each year-end
 - Rates are set biennially based on “odd year” actuarial valuations
 - “Even year” valuations are strictly advisory
- The rates determined by the actuarial valuation are adopted by the Board and go into effect 18 months subsequent to the valuation date

Valuation Date	Employer Contribution Rates
12/31/2009	July 2011 – June 2013
12/31/2011	July 2013 – June 2015

Assumptions selected today will be used in the 12/31/2011 valuation, which will be completed in the fall of 2012

Introduction

Objectives for Actuarial Methods and Assumptions

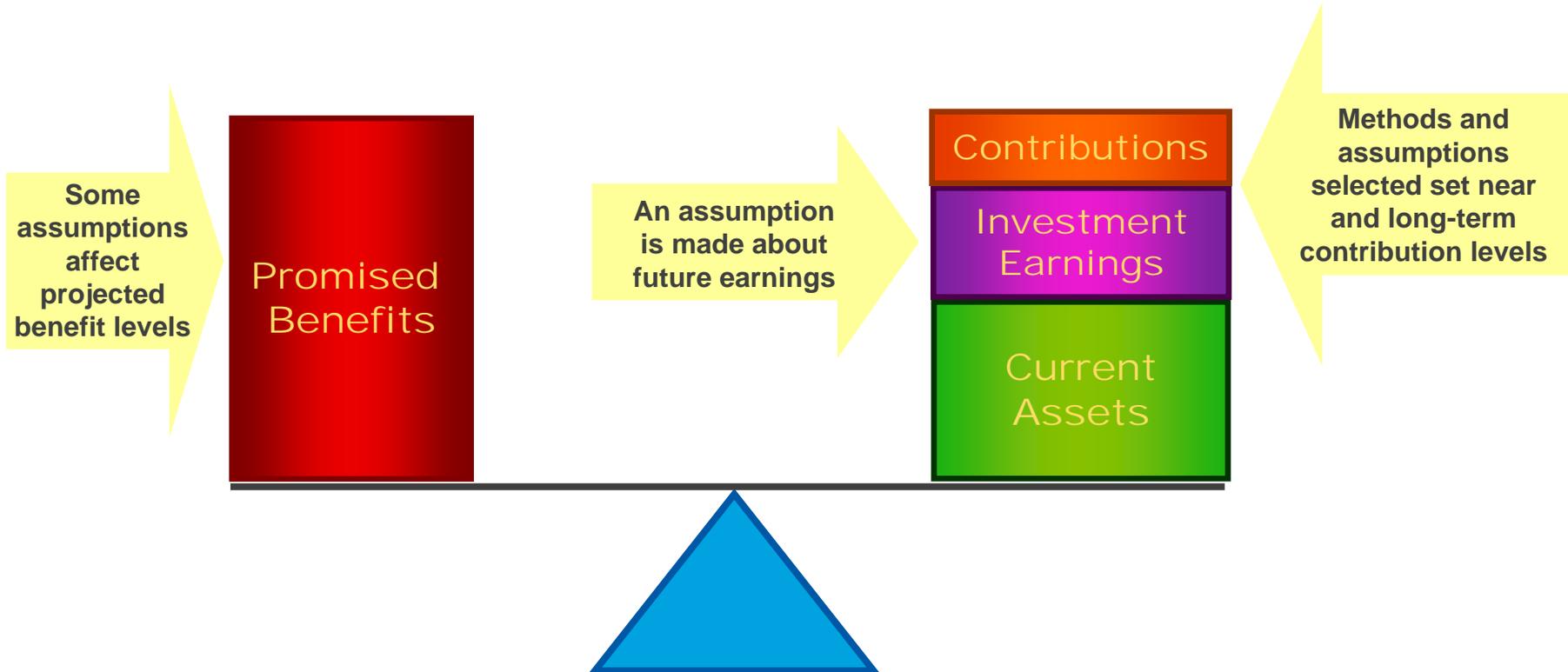
- Transparent
- Predictable and stable rates
- Protect funded status
- Equitable across generations
- Actuarially sound
- GASB compliant

Certain objectives serve as competing priorities
(Example: Predictable and stable rates; protect funded status)

Introduction

Framework for Setting Assumptions and Methods

The valuation can be viewed as a funding exercise based on long-term assumptions about an uncertain future



The long-term earnings assumption does not affect benefit levels (with a key exception) or long-term contribution levels – it only affects contribution timing

Introduction

Framework for Setting Assumptions and Methods

- If viewed as a funding exercise that uses a single assumption set about an uncertain future, the valuation answers two funding questions:
 - What is the current estimated funding shortfall for service already rendered if all assumptions are met in the future?
 - What contribution rates would be necessary to (a) eliminate the funding shortfall over a fixed time period and (b) fund benefits projected to be earned in the future years by members if all assumptions are met in the future?
- Assumptions do not affect the program's long-term cost, with the exception of future retirements under the Tier 1/Tier 2 Money Match benefit formula

Long-Term Cost = Benefits Paid - Investment Earnings = Total Contributions

Introduction

Framework for Setting Assumptions and Methods

- Assumptions and methods do affect contribution timing
- One certainty: actual future experience will vary from assumption
 - Actual future experience, not assumptions, will determine long-term cost
 - Deviations from assumptions will lead to positive or negative variations from financial projections of future contribution rates
 - Typically, the largest deviations arise from actual annual investment return experience
 - Actual experience is not affected by the return assumption selected
 - If negative variances occur repeatedly or are severe, then:
 - Funding shortfalls can increase to a high percentage of system payroll
 - Contribution rates calculated to eliminate shortfall over a generation can rise to untenable levels
 - In extreme instances, benefit security can be compromised

Long-Term Cost = Benefits Paid - Investment Earnings = Total Contributions



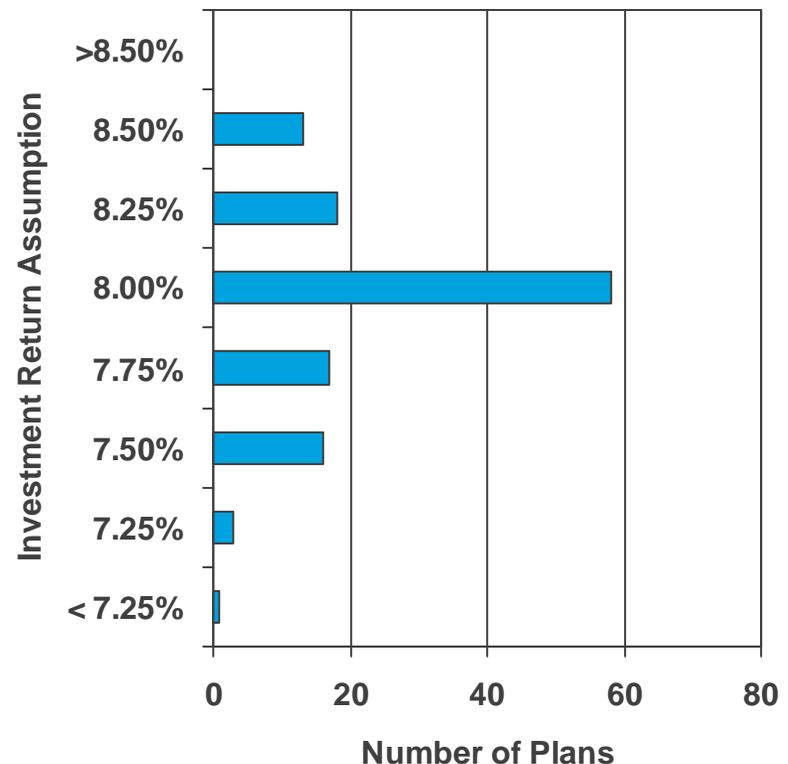
Investment Return Assumptions

Economic Assumptions

Investment Return

- In our May 26, 2011 Board presentation, we deferred a proposal on the investment return assumption until the OIC's investment consultant completed their review of capital market assumptions.
- In order to add a broader perspective to the discussion, the chart on the right shows the assumptions used by the 120 large public sector systems in the NASRA survey.
- The current assumption of 8.0% is the median and most common assumption in the survey.
- The mean (weighted average) rate selected is approximately 7.9%
- The survey covers valuation dates that range from June 2007 to January 2010

**Distribution of Investment
Return Assumptions**
2010 NASRA Survey Data



Economic Assumptions

Investment Return – Regular Account

Percentile	Mercer	SIS
25 th	5.74%	6.29%
45 th	7.48%	7.81%
50th	7.88%	8.16%
55 th	8.28%	8.51%
75 th	10.03%	10.03%

20 Year Time Horizon

- The table compares the distribution of expected annualized returns over 20 years for the regular account based on Mercer and SIS capital market assumptions.
 - Returns are net of administrative and passive investment expenses
 - No active management return is included
- A range of reasonable assumptions exists. Using a “50th percentile or lower” assumption:
 - Improves benefit security
 - Increases the probability that actual returns meet or exceed the assumption
- The current assumption of 8.0% is in the reasonable range based on current expectations
- Assumptions of 7.50%, 7.75% or 7.90% are also in the reasonable range and would increase the likelihood the assumption is met in a given year

To illustrate the estimated impact of an assumption change, the effects of a 7.75% regular account assumption are shown at the end of the presentation

Economic Assumptions

Investment Return – Variable Account – Mercer Assumptions

Percentile	Regular Account	Variable Account
25 th	5.74%	5.15%
45 th	7.48%	7.53%
50th	7.88%	8.07%
55 th	8.28%	8.62%
75 th	10.03%	11.00%

20 Year Time Horizon

- A separate assumption is used for variable account balances, which are invested solely in equities
- Using Mercer Investment Consulting assumptions the 50th percentile expected return is 7.88% for the Regular account and 8.07% for the Variable account both net of expenses and before reflecting any margin for active management.
- We assumed 5 basis points in administrative expenses and 20 basis points in passive investment expenses.
- At the 50th percentile, the variable return is expected to exceed the regular account return by approximately 20 basis points



Demographic Assumptions

Demographic Assumptions

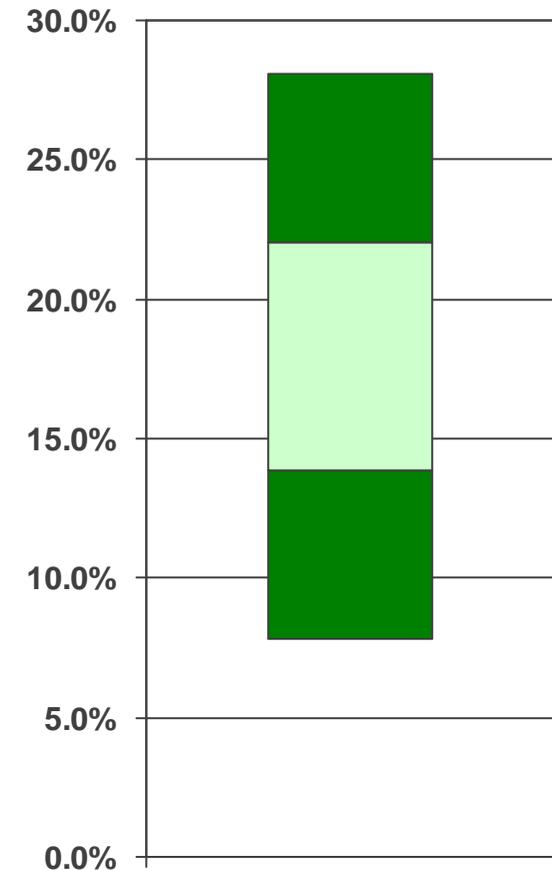
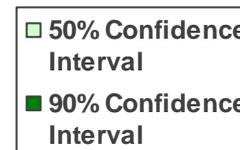
Overview

- Compared actual experience from January 1, 2007 through December 31, 2010 to expected experience based on assumptions from the December 31, 2009 actuarial valuation
- Actual experience, combined with future expectations, are used to develop proposed assumptions for December 31, 2010 and December 31, 2011 actuarial valuations
- The presentation summarizes those results, primarily for assumptions where significant changes are proposed.
- More details are available in:
 - Our forthcoming written report
 - The appendix of this presentation

Demographic Assumptions

Confidence Intervals

- We use 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.



Mortality Assumptions

Summary of Proposed Assumptions

Note that “white collar” and “blue collar” are terms used in the RP 2000 mortality table to adjust levels of mortality. They are used here to identify the adjustments made and are not intended to classify any employees as either “blue collar” or “white collar.”

	Current Assumption	Proposed Changes
Healthy Retired	RP 2000, Generational Combined Active/Healthy Retired, Sex distinct	No change
<ul style="list-style-type: none"> School district male Other GS male 	White collar, set back 12 months White collar, no set back	White collar, set back 18 months Blend 25% blue collar, set back 12 months
<ul style="list-style-type: none"> P&F male 	Blend 33% blue collar, no set back	No change
<ul style="list-style-type: none"> School district female Other female 	White collar, set back 18 months Blend 33% blue collar, no set back	White collar, set back 24 months White collar, no set back
Disabled Retired	RP 2000, Static, No Collar Combined Active/Healthy Retired, Sex distinct	No change
<ul style="list-style-type: none"> Male Female 	Set forward 60 months, min of 2.25% Set forward 48 months, min of 2.25%	No change No change
Non-Retired Mortality	% of Healthy Retired Mortality	% of Healthy Retired Mortality
<ul style="list-style-type: none"> School district male Other GS male P&F male 	75% 75% 70%	No change 85% No change
<ul style="list-style-type: none"> School district female Other female 	50% 50%	60% No change

Mortality Assumptions

Healthy Retired Mortality

Healthy Retiree Mortality
Aggregate Confidence Intervals and Rates



- We analyze mortality experience for non-disabled members in five groupings
- When the current assumption lies outside of the 90% confidence interval for the aggregate mortality rate, we have proposed a change for that group
- The amount of data available in each group affects the size of the confidence interval
- Note that the aggregate mortality rate is a function of both the group mortality rates and the ages of the members in the group.
 - The groups have different average ages. This means you can not conclude, for example, that Police & Fire males have lower mortality than other groups based on the data in the graph.

Mortality Assumptions

Healthy Retired Mortality

	Exposures	Actual Deaths	Current Assumption		Proposed Assumption	
			Expected Deaths	A/E Ratio	Expected Deaths	A/E Ratio
School District Male	59,024	1,649	1,718	96%	1,634	101%
Other General Service Male*	88,837	2,778	2,936	95%	2,776	100%
Police & Fire Male	20,685	357	379	94%	379	94%
School District Female	117,027	2,668	2,815	95%	2,677	100%
Other Female*	113,764	3,356	3,475	97%	3,340	100%

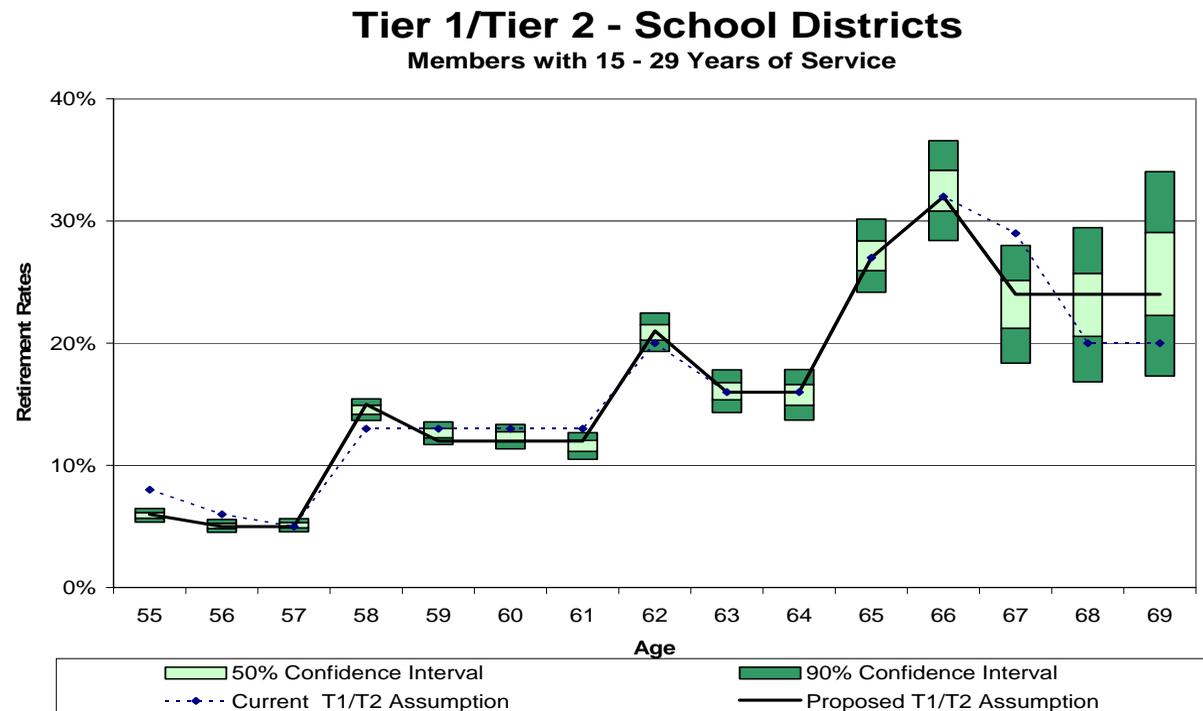
* Includes beneficiaries.

- The Actual/Expected ratio for healthy retirees under a generational table should be approximately 100% because the table has future mortality improvement built into it.
- The Actual/Expected ratio for all groups is below 100%. For 4 out of 5 groups, the aggregate mortality rate was outside of the 90% confidence interval.
 - While the Actual/Expected ratio for Police & Fire Males was 94%, the aggregate rate was within the confidence interval. We propose continued monitoring but no immediate change to the assumption for that group.
- We modified the “white collar”/“blue collar” adjustments and age set backs to adjust the current tables to match Oregon PERS experience.

Retirement Assumptions Structure

- Retirement rates vary by job classification and service levels:
 - General Service
 - Service bands at <15 years, 15 to 29 years, and 30+ years
 - First two bands distinguish between School Districts and all others
 - Police & Fire
 - Service bands at <13 years, 13 to 24 years, and 25+ years

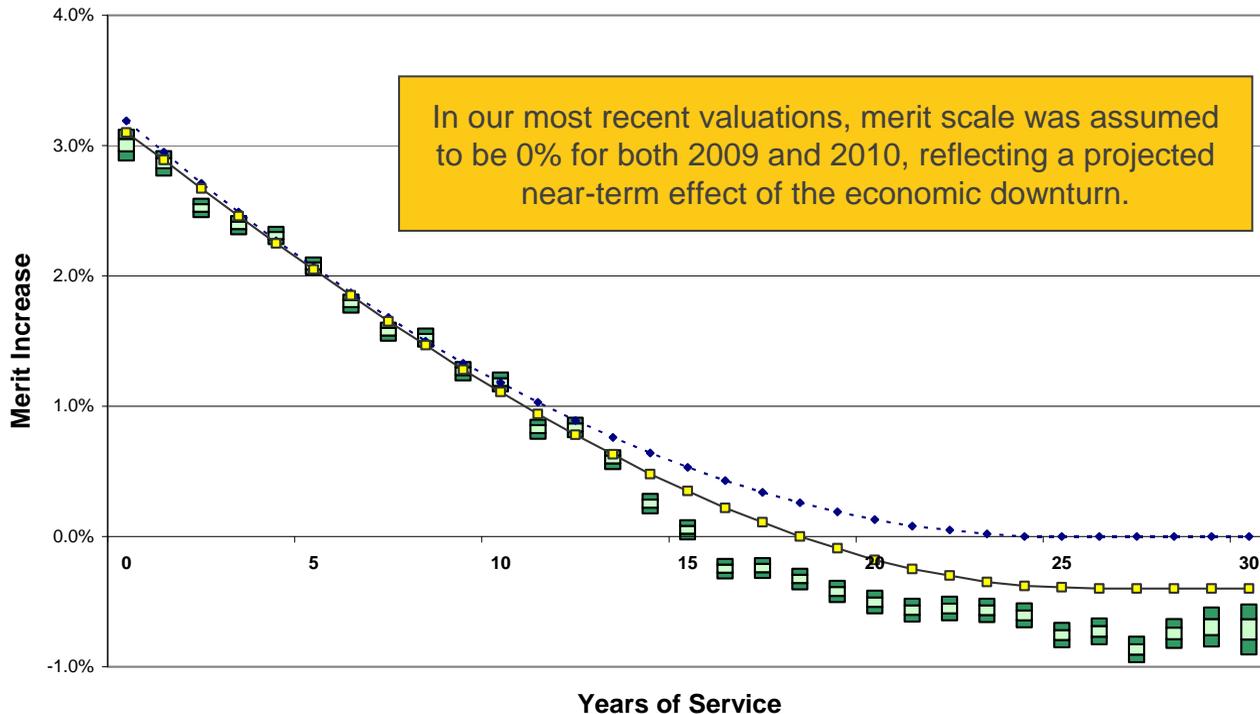
- Minor modifications were made to most assumptions to more closely match recent experience
- An example is shown at right. Charts for additional groups can be found in the appendix.



Salary Increase Assumptions

Summary of Proposed Assumptions

School Districts



50% Confidence Interval
 90% Confidence Interval
 Current
 Proposed Assumption

For the merit scale, we studied experience from 2003 through 2010.

- Merit increases are added to inflation and general productivity to arrive at a total salary increase assumption
- Current assumptions set for three groups:
 - School Districts (SD)
 - Other General Service (Other GS)
 - Police & Fire (PF)
- Proposed changes:
 - Decrease Merit Scale modestly for SD at 10+ years of service
 - Decrease Merit Scale for Other GS slightly
 - Maintain Merit Scale for PF
- Proposed rates attempt to not overreact to 2009 and 2010 experience

Termination Assumptions

Structure of Termination Assumption

- Our pre-retirement employment termination assumption is exclusively age-based for members with three or more years of service
 - For the first three years of employment, the age-based rate is increased to reflect the higher likelihood of termination in initial years of employment
 - This is called a “select and ultimate” rate structure, with the three-year select period followed by ultimate rates
- Prior valuations have used the same ultimate rates for Tier 1/Tier 2 and OPSRP
- We propose introducing a distinction between Tier 1/Tier 2 and OPSRP ultimate rates
 - Assumptions for Tier 1/Tier 2 will be based on experience for that closed group
 - Because it is closed, this group will increasingly exhibit greater average service at any age than the overall system (i.e. when OPSRP is included)
 - May lead to diverging termination experience for Tier 1/Tier 2 members compared to that of membership for the system as a whole
 - OPSRP assumptions will be based on overall system experience
- We also propose eliminating the distinction between General Service employees of SLGRP and Independent employers
 - Observed experience is similar, and the change would simplify the valuation and increase statistical credibility of the assumption

Termination Assumptions

Summary of Proposed Assumptions

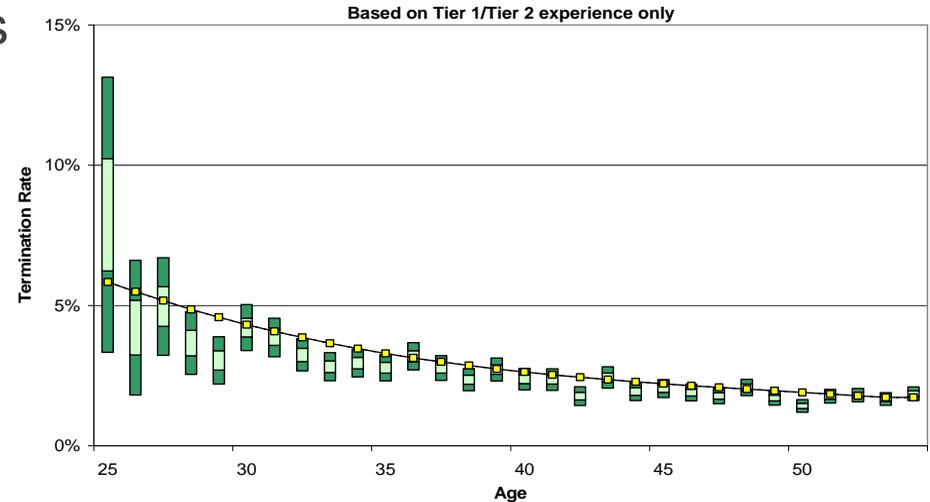
- In general, the study period data showed:
 - Tier 1/Tier 2 termination experience was at or slightly below the current assumption
 - Overall system experience (reflecting OPSRP) was above the current assumption

- Where we proposed new assumptions, we did not move rates all the way to recent experience
 - Aware that the financial crisis and its aftermath influenced experience in manner not expected for long-term

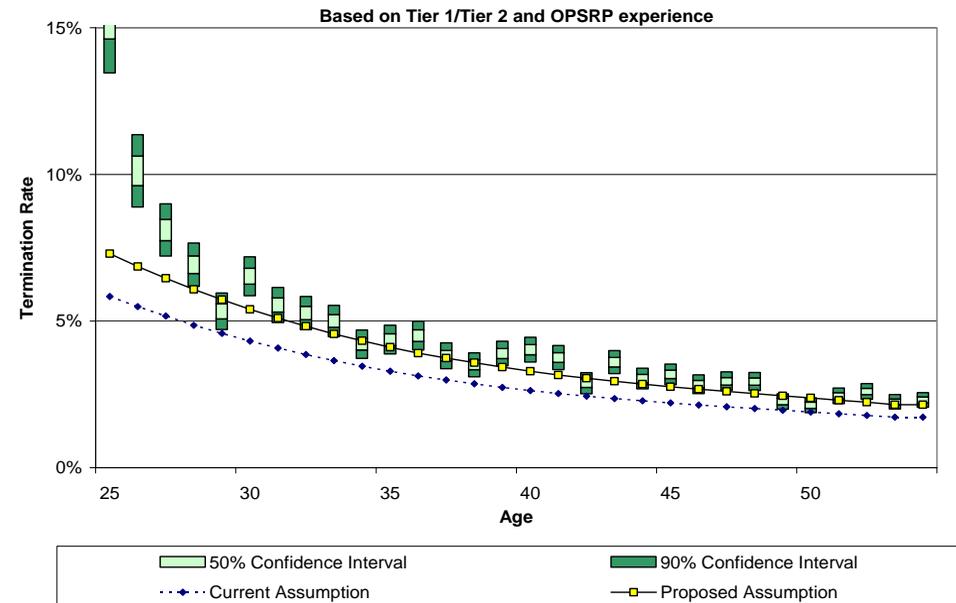
- Illustrated at right for School Districts

- See appendix for additional graphs.

School Districts - Tier 1/Tier 2



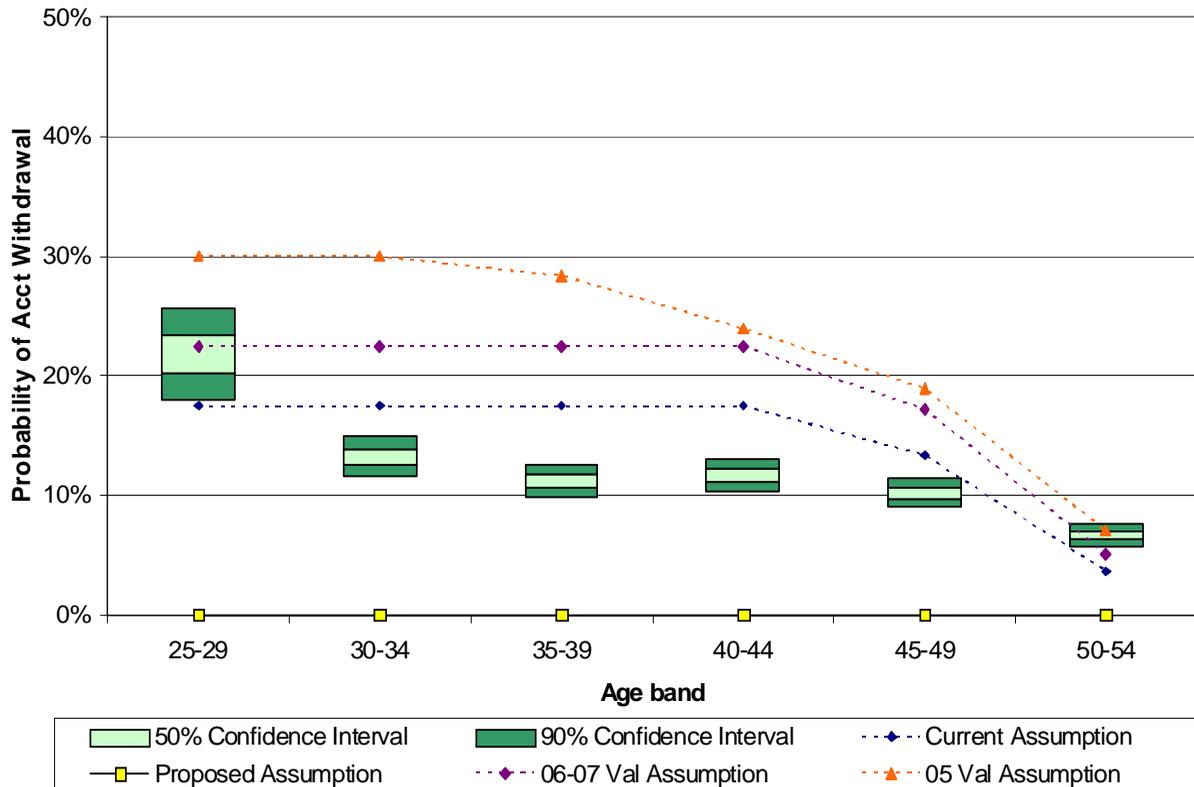
School Districts - OPSRP



Probability of Account Withdrawal Assumptions

Summary of Proposed Assumptions

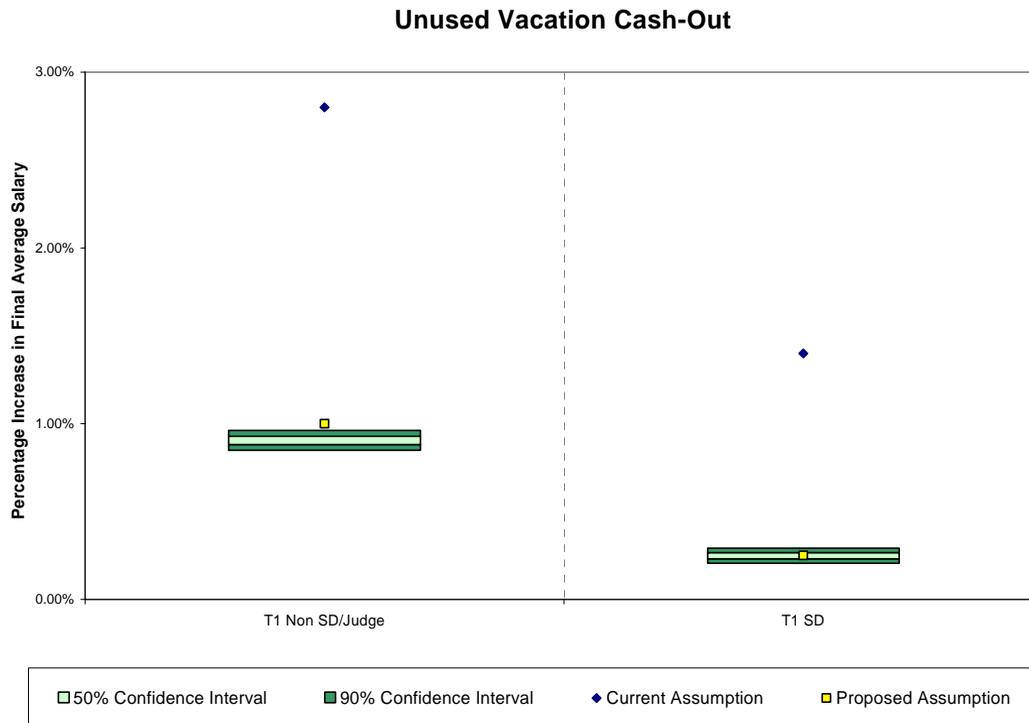
General Service



- This assumption represents the probability that a terminating Tier 1/Tier 2 member will withdraw his/her account balance from the plan before retirement
- This option is a progressively worse financial choice as time passes since member accounts get no new contributions.
- Experience shows significant downward trend
 - Latest experience suggests reducing the assumption further
- We propose assuming no account withdrawals in the future
 - The approach anticipates the future steady-state
 - Simplifies valuation
 - Does not assume financially questionable member behavior

Unused Vacation Pay Cash-Out

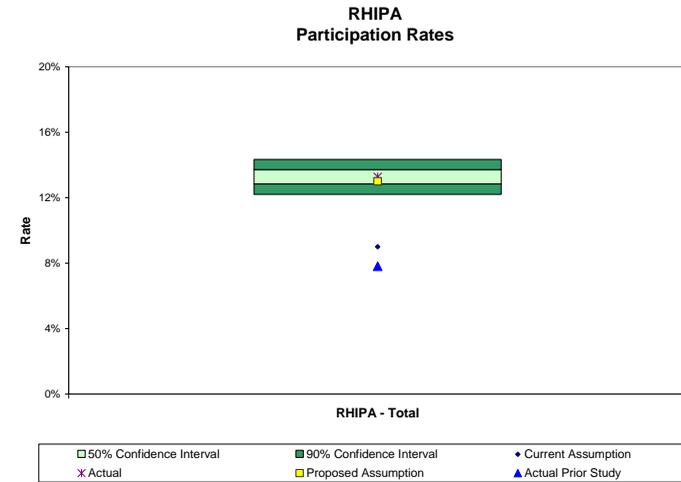
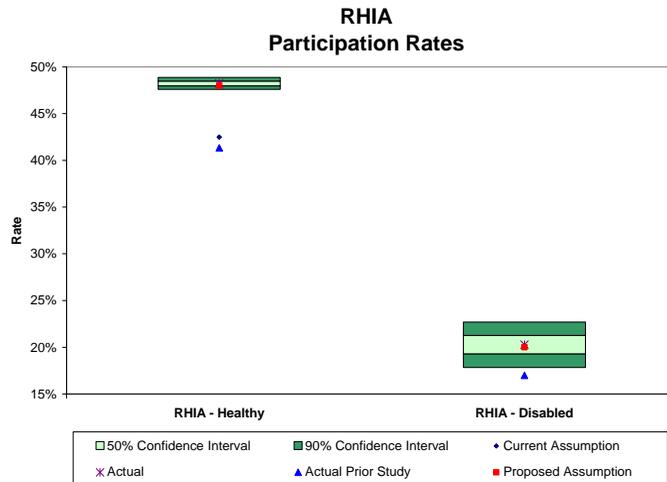
Summary of Proposed Assumptions



- The final average salary for Tier 1 members can include the effect of any unused vacation cash-out at retirement
- We assume this produces a fixed percentage increase to the final average salary
 - Our assumption separates School Districts vs. all others
 - Does not affect benefits calculated under Money Match
- Data was not available to review this assumption in past experience studies
- Data provided for the current experience study indicates the assumption should be lowered for both groups

Retiree Healthcare Assumptions

Summary of Proposed Assumptions



- Participation rates among both RHIPA and healthy RHIA participants increased (held steady among RHIA participants with disabilities)
- Participation levels may be affected by:
 - Economic conditions and cost of coverage
 - Relative attractiveness of RHIA/RHIPA programs compared to alternatives
- We propose rates near the middle of the 50% confidence interval
 - Participation experience can change quickly, and should be monitored going forward

Other Assumptions

Summary of Proposed Assumptions

	Current Assumption	Proposed Changes
Duty Disability <ul style="list-style-type: none"> ▪ Police & Fire ▪ General Service 	Percentage of the 1985 Disability Class 1 Rates <ul style="list-style-type: none"> ▪ 15% (0.005% -- 0.127%) ▪ 1.5% (0.0005% -- 0.013%) 	No Change
Ordinary Disability	50% of 1985 Disability Class 1 Rates w/ 0.20% cap (0.015% -- 0.200%)	50% of 1985 Disability Class 1 Rates w/ 0.18% cap (0.015% -- 0.180%)
Partial Lump Sum	6% for all years	No Change
Total Lump Sum	6% for 2009, declining 0.5% per year until reaching 0%	No Change
Purchase of Credited Service	Non-Money Match Retirements: 55%	Non-Money Match Retirements: 60%
Unused Sick Leave* <ul style="list-style-type: none"> ▪ School District (M) ▪ School District (F) ▪ State General (M) ▪ State General (F) ▪ Local General (M) ▪ Local General (F) ▪ State P&F ▪ Local P&F ▪ Dormant 	7.50% 6.75% 5.75% 4.25% 4.25% 3.00% 7.25% 8.25% 3.50%	8.25% 6.50% 6.25% 3.75% No change No change 5.50% 7.50% 2.50%

* For members eligible to include unused sick leave in final average salary, final average salary is increased by the percentages noted above to model the estimated effects of sick leave



Actuarial Methods

Treatment of Negative Rate Guarantee Reserve

Actuarial Methods

Treatment of Negative Rate Guarantee Reserve

- One unresolved actuarial methods issue is how to treat a negative Tier 1 Rate Guarantee Reserve (RGR) in valuation calculations
 - Reserves are earmarked for a dedicated purpose and thus not intended to be available to meet general benefit payment obligations
 - To reflect this, reserves are typically subtracted from the market value of assets in valuation calculations

$$\text{Valuation Assets} = \text{Market Value of Assets} - \text{Reserves}$$

- Unlike a typical reserve the RGR can be in deficit and thus become negative
 - In the 12/31/2009 valuation, the negative RGR was subtracted from the market value of assets
 - That approach can be justified theoretically, but an outcome of that approach is that a negative RGR is treated as an asset for valuation calculation purposes
- Our proposal is to never treat a RGR as a valuation asset, whether positive or negative
 - This would avoid valuation assets potentially exceeding market value of assets
 - In addition, this approach recognizes the dedicated nature of each of the separate reserves

This issue was discussed at length in May, and the pertinent slides from the May presentation are included in the Appendix



Decisions

Estimated Impact of Changes on Employer Rates

Effect on Uncollared Base Rate

Slide 31 of Mercer's May 2011 presentation illustrates the benefit impact of an alternative return assumption for a sample member under Money Match.

	Tier 1/Tier 2		OPSRP		RHIA/RHIPA	
	Normal Cost Rate	UAL Rate	Normal Cost Rate	UAL Rate	Normal Cost Rate	UAL Rate
Mortality	0.1%	0.4%	0.1%	0.0%	0.0%	0.0%
Other Demographic Assumptions	(0.4%)	(0.1%)	(0.2%)	0.0%	0.0%	0.0%
Treatment of Negative RGR	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%
Total	(0.3%)	0.5%	(0.1%)	0.0%	0.0%	0.0%
7.75% Regular Return	0.6%	1.0%	0.4%	0.0%	0.0%	0.0%
Total	0.3%	1.5%	0.3%	0.0%	0.0%	0.0%

- Estimated impact is shown on a systemwide basis. The impact from rate pool to rate pool (or among individual independent employers) will vary.
- The estimated impact for treatment of the negative Rate Guarantee Reserve is based on a 12/31/2010 Rate Guarantee Reserve level of negative \$199 million. Impact of alternative approaches can vary significantly in future years based on the magnitude of any potential negative Rate Guarantee Reserve.

Decisions

Summary of Proposed Assumptions– Methods and Economic Assumptions

	Current Assumption	Proposed Assumption
Regular Investment Return	8.00%	7.50% - 8.00%*
Variable Investment Return	8.50%	7.75% - 8.25%**
Health Cost Trend Rate		
▪ 2011 Trend Rate	7.00%	No Changes
▪ Ultimate Trend Rate	4.50%	
▪ Year Reaching Ultimate Trend	2029	
OPSRP Administrative Expenses	\$6.6 million	No Change
Percentage of Money Match retirements for allocation between employers	General: 50% P&F: 15%	General: 40% P&F: 10%
Treatment of Negative Tier 1 Rate Guarantee Reserve	Treat as asset	Do not treat as an asset

* Based on Mercer’s capital market assumptions, we propose an assumption in the 7.5%-8.0% range. The SIS capital market assumptions without an active management component are 0.2%-0.3% above Mercer assumptions.

** Proposed to be 20-25 basis points greater than regular investment return assumption.

Decisions

Summary of Proposed Assumptions– Demographic Assumptions

	Current Assumption	Proposed Assumption
Mortality	Generational Tables	Modest decreases to rates for most groups to reflect recent experience
Turnover	Combined T1/T2/OPSRP	Separate T1/T2 & OPSRP
Merit Salary Increases	0% for 2009 and 2010, then slightly higher ultimate rates	Slightly lower ultimate rates; No select rates
RHIA Participation Rate	Healthy: 42.5% Disabled: 20%	Healthy: 48% Disabled: 20%
RHIPA Participation Rate	9%	13%
Proposed assumptions also include all other demographic changes shown in the body of this presentation and its appendix		

Decisions

Requested Board Action

- In order to complete the December 31, 2010 actuarial valuation on schedule, we request the following actions from the Board
 - Selection of regular account investment return assumption
 - Approval of variable account investment return assumption 25 basis point greater than the regular account return assumption
 - Selection of method for treatment of Rate Guarantee Reserve
 - Approval of all proposed assumptions in this presentation (including appendix) for demographic and economic assumptions not specifically listed above

Next Steps

- May Board Meeting
 - Experience Study – Methods and Economic Assumptions
- July Board Meeting
 - Experience Study – Investment Return and Demographic Assumptions
 - Board Adoption of Methods and Assumptions for 12/31/2010 and 12/31/2011 Actuarial Valuations
- September Board Meeting
 - 12/31/2010 system-wide actuarial valuation results
 - Actuarial equivalence factors for 2012-2013
- October
 - 12/31/2010 individual employer reports



Appendix

Appendix

Important Notices

Mercer has prepared this report exclusively for the Oregon PERS Board; Mercer is not responsible for reliance upon this report by any other party. The only purposes of this report are to present results of Mercer's review of experience under the plan. This report may not be used for any other purpose; Mercer is not responsible for the consequences of any unauthorized use.

Decisions about benefit changes, granting new benefits, investment policy, funding policy, benefit security and/or benefit-related issues should not be made on the basis of this report, but only after careful consideration of alternative economic, financial, demographic and societal factors, including financial scenarios that assume future sustained investment losses.

The Oregon Investment Council (OIC) is solely responsible for selecting the plan's investment policies, asset allocations and individual investments of the Oregon PERS program. Mercer's actuaries have not provided any investment advice to Oregon PERS or OIC.

A valuation report is only a snapshot of a Plan's estimated financial condition at a particular point in time; it does not predict the Plan's future financial condition or its ability to pay benefits in the future and does not provide any guarantee of future financial soundness of the Plan. Over time, a plan's total cost will depend on a number of factors, including the amount of benefits the plan pays, the number of people paid benefits, the period of time over which benefits are paid, plan expenses and the amount earned on any assets invested to pay benefits. These amounts and other variables are uncertain and unknowable at the valuation date

Because modeling all aspects of a situation is not possible or practical, we may use summary information, estimates, or simplifications of calculations to facilitate the modeling of future events in an efficient and cost-effective manner. We may also exclude factors or data that are immaterial in our judgment. Use of such simplifying techniques does not, in our judgment, affect the reasonableness of valuation results for the plan.

To prepare the valuation report, actuarial assumptions, as described in the actuarial valuation report as of December 31, 2009, for Oregon PERS are used in a forward looking financial and demographic model to select a single scenario from a wide range of possibilities; the results based on that single scenario are included in the valuation. The future is uncertain and the plan's actual experience will differ from those assumptions; these differences may be significant or material because these results are very sensitive to the assumptions made and, in some cases, to the interaction between the assumptions.

Appendix

Important Notices

Different assumptions or scenarios within the range of possibilities may also be reasonable and results based on those assumptions would be different. As a result of the uncertainty inherent in a forward looking projection over a very long period of time, no one projection is uniquely “correct” and many alternative projections of the future could also be regarded as reasonable. Two different actuaries could, quite reasonably, arrive at different results based on the same data and different views of the future. A "sensitivity analysis" shows the degree to which results would be different if you substitute alternative assumptions within the range of possibilities for those utilized in this report. This report displays a limited-scope sensitivity analysis of alternate actuarial assumptions, as detailed in this report. At Oregon PERS request, Mercer is available to perform additional sensitivity analyses.

Actuarial assumptions may also be changed from one valuation to the next because of changes in mandated requirements, plan experience, changes in expectations about the future and other factors. A change in assumptions is not an indication that prior assumptions were unreasonable when made.

The calculation of actuarial liabilities for valuation purposes is based on a current estimate of future benefit payments. The calculation includes a computation of the "present value" of those estimated future benefit payments using an assumed discount rate; the higher the discount rate assumption, the lower the estimated liability will be. For purposes of estimating the liabilities (future and accrued) in this report, Oregon PERS selected an assumption based on the expected long term rate of return on plan investments. Using a lower discount rate assumption, such as a rate based on long-term bond yields, could substantially increase the estimated present value of future and accrued liabilities.

Because valuations are a snapshot in time and are based on estimates and assumptions that are not precise and will differ from actual experience, contribution calculations are inherently imprecise. There is no uniquely “correct” level of contributions for the coming plan year.

Valuations do not affect the ultimate cost of the Plan. Plan funding occurs over time. Contributions not made this year, for whatever reason, including errors, remain the responsibility of the Plan sponsor and can be made in later years. If the contribution levels over a period of years are lower or higher than necessary, it is normal and expected practice for adjustments to be made to future contribution levels to take account of this with a view to funding the plan over time.

Appendix

Important Notices

Data, computer coding and mathematical errors are possible in the preparation of a valuation involving complex computer programming and thousands of calculations and data inputs. Errors in a valuation discovered after its preparation may be corrected by amendment to the valuation or in a subsequent year's valuation.

To prepare this report, Mercer has used and relied on member and financial data submitted by the Oregon Public Employees Retirement System as summarized herein and in the December 31, 2009 actuarial valuation report and on investment return information as published by Oregon PERS and Oregon Investment Council (OIC). Oregon PERS is responsible for ensuring that such participant data provides an accurate description of all persons who are participants under the terms of the plan or otherwise entitled to benefits as of December 31, 2009, that is sufficiently comprehensive and accurate for the purposes of this report. Although Mercer has reviewed the data in accordance with Actuarial Standards of Practice No. 23, Mercer has not verified or audited any of the data or information provided.

Mercer has also used and relied on the plan provisions described in Oregon Revised Statutes Sections 238 and 238A and legislative amendments supplied by Oregon PERS. A summary of the plan provisions valued is presented in our report. Oregon PERS is solely responsible for the accuracy, validity and comprehensiveness of this information. If the data or plan provisions supplied are not accurate and complete the valuation results may differ significantly from the results that would be obtained with accurate and complete information; this may require a later revision of this report. Moreover, plan documents may be susceptible to different interpretations, each of which could be reasonable, and that the different interpretations could lead to different valuation results.

Assumptions used are based on the last experience study, as adopted by the Board on July 16, 2009, and alternative proposed assumptions as described herein. The Board is responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods and assumptions. This valuation is based on assumptions, plan provisions, methods and other parameters so prescribed and as summarized in this report. Oregon PERS is solely responsible for communicating to Mercer any changes required thereto.

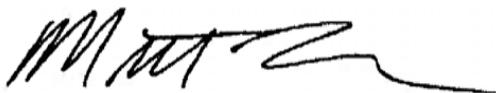
Appendix

Important Notices

Professional Qualifications

We are available to answer any questions on the material in this report or to provide explanations or further details as appropriate. The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest, that would impair the objectivity of our work.

We are available to answer any questions on the material contained in the report, or to provide explanations or further details as may be appropriate.



July 29, 2011

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Date



July 29, 2011

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Date

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The information contained in this document is not intended by Mercer to be used, and it cannot be used, for the purpose of avoiding penalties under the Internal Revenue Code that may be imposed on the taxpayer.

Appendix

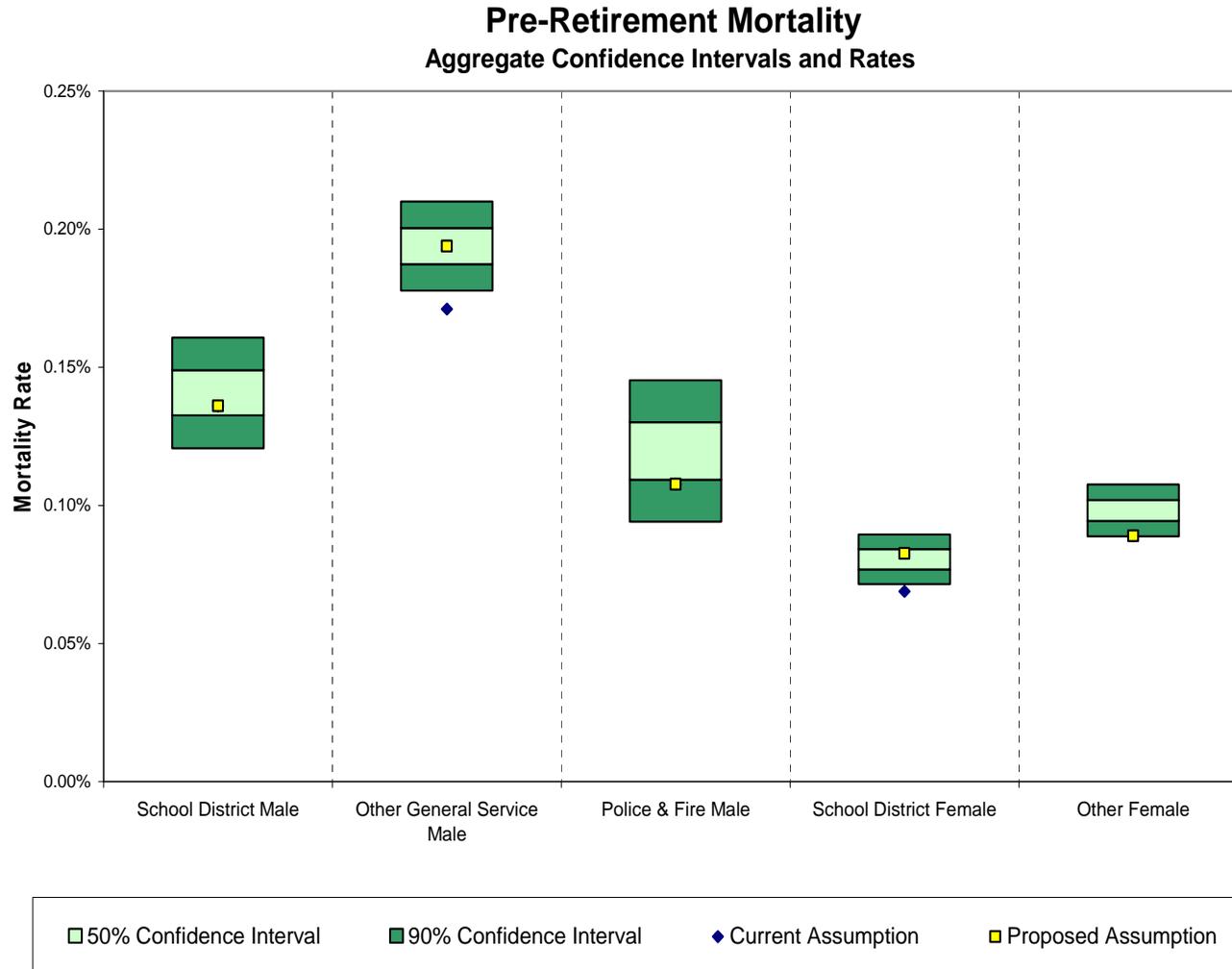
Pre-Retirement Mortality

	Exposures	Actual Deaths	Current Assumption		Proposed Assumption	
			Expected Deaths	A/E Ratio	Expected Deaths	A/E Ratio
School District Male	94,506	133	129	103%	129	103%
Other General Service Male	201,964	392	346	113%	392	100%
Police & Fire Male	49,294	59	53	111%	53	111%
School District Female	270,852	218	187	117%	224	97%
Other Female	300,557	295	267	110%	267	110%

- Pre-retirement mortality is set based on a percentage of the healthy retiree mortality rates. The “Current Assumption” is analyzed by applying the current percentage to the new proposed healthy retiree mortality rates.
- The analysis is based on experience for active employees under age 70.
- The target Actual/Expected ratio is 100%.
- Although Police & Fire Male and School District Male and Other Female are above 100%, the current rates fall within the aggregate confidence interval and thus no changes are proposed for those three groups. For the other groups, we are proposing a change to the percentage applied to the new proposed healthy retiree mortality rates.

Appendix

Pre-Retirement Mortality (*continued*)

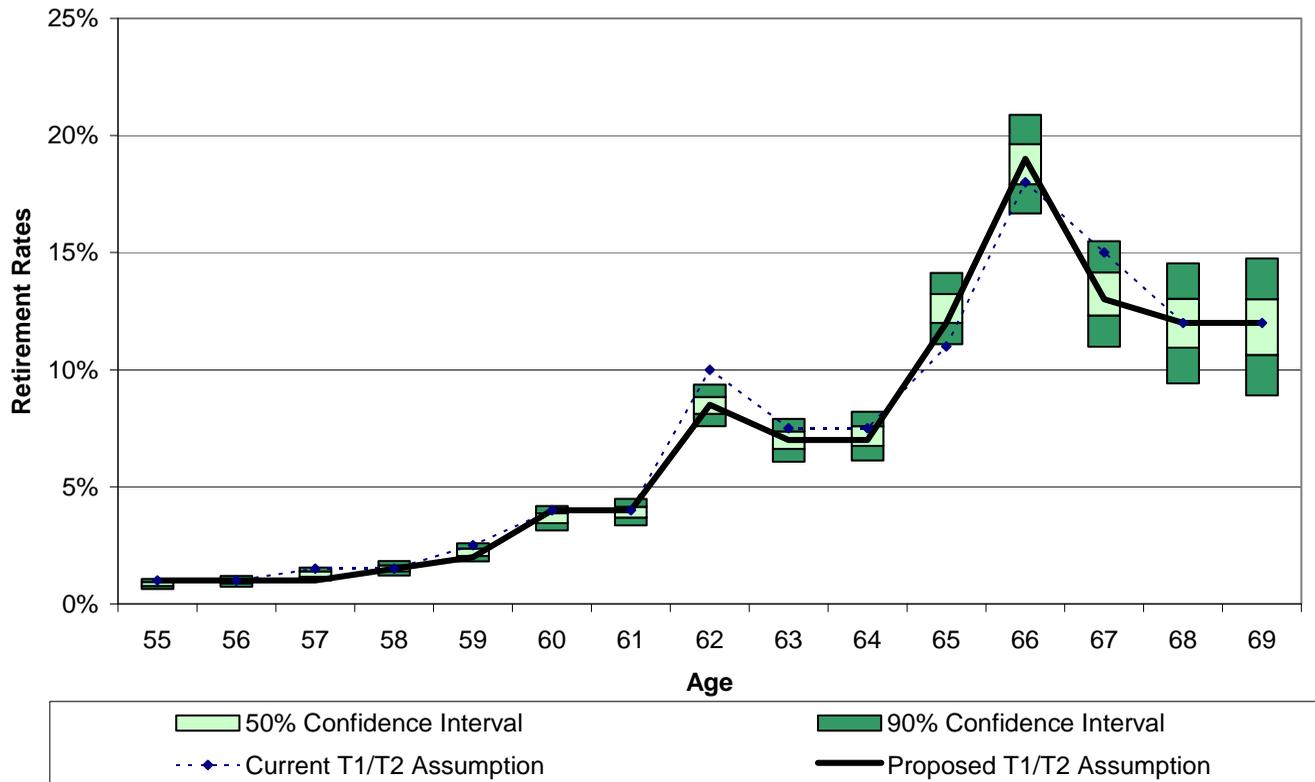


- Changes are proposed to Other GS Male and School District Female so the aggregate rate falls within the confidence interval.
- Note that the aggregate mortality rate is a function of both the group mortality rates and the ages of the members in the group.

Appendix

Retirement Rates – General Service with less than 15 Years of Service

Tier 1/Tier 2 - Other General Service Members with less than 15 Years of Service

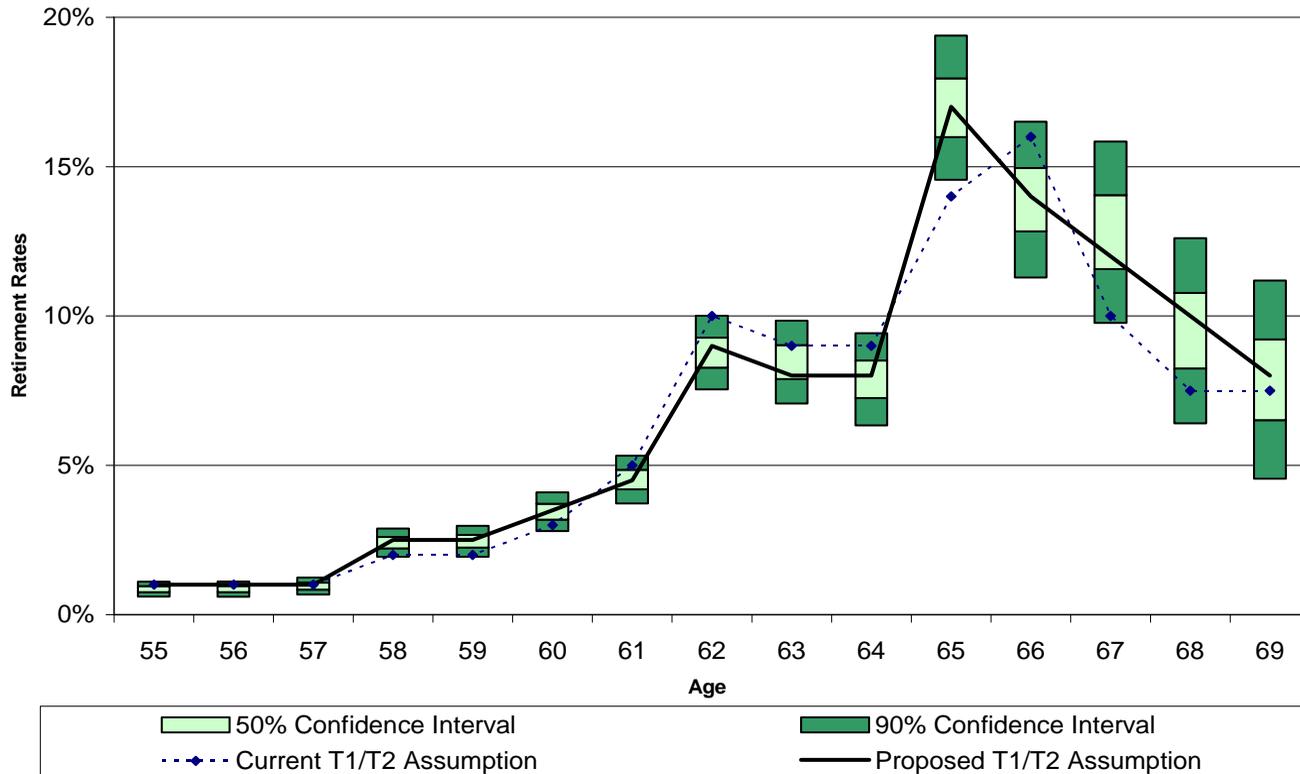


- Retirement decisions by members with less than 15 years of service are likely to be heavily influenced by the availability of resources other than PERS benefits, including:
 - Social Security
 - Prior employment
 - Spousal benefits
 - Savings

Appendix

Retirement Rates – General Service with less than 15 Years of Service

Tier 1/Tier 2 - School Districts Members with less than 15 Years of Service



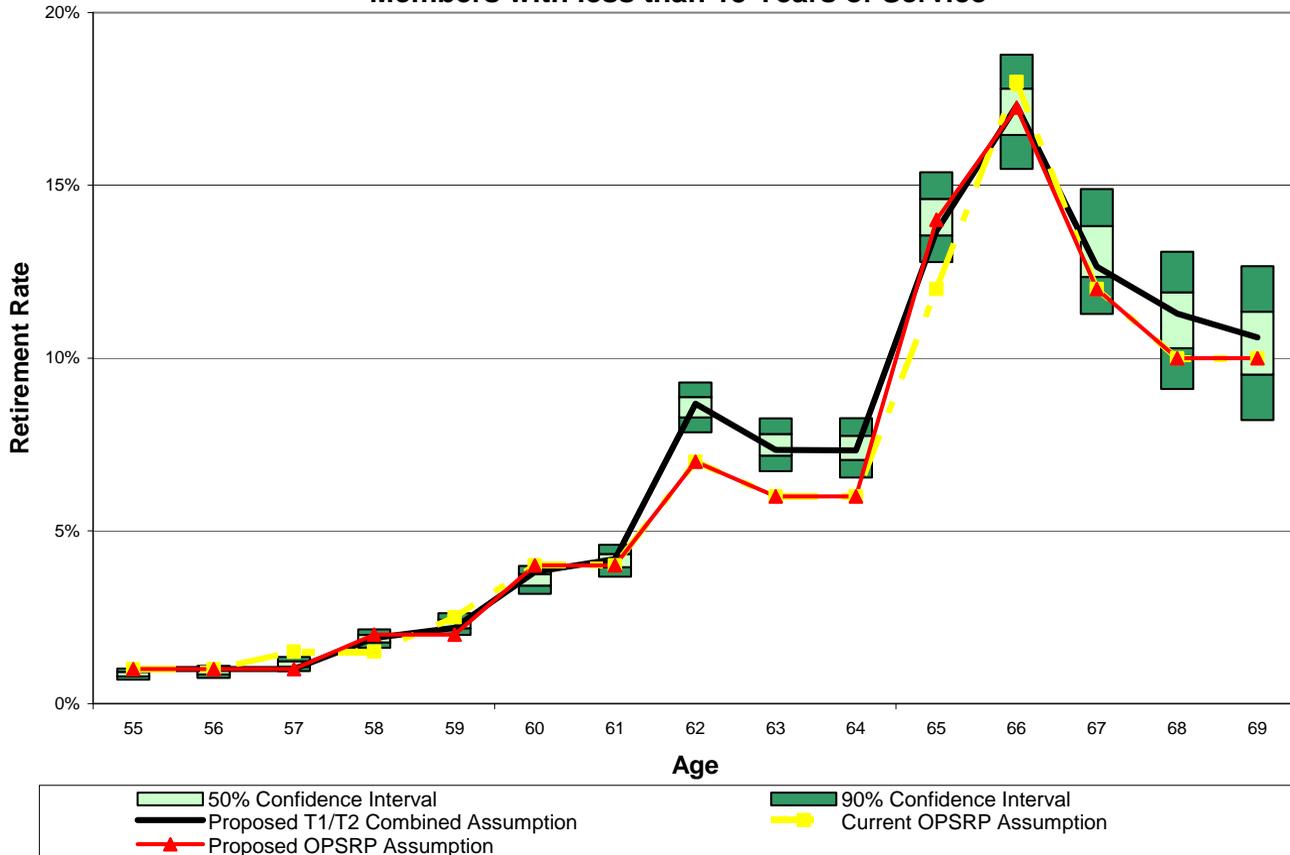
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Appendix

Retirement Rates – General Service with less than 15 Years of Service

OPSRP - General Service

Members with less than 15 Years of Service

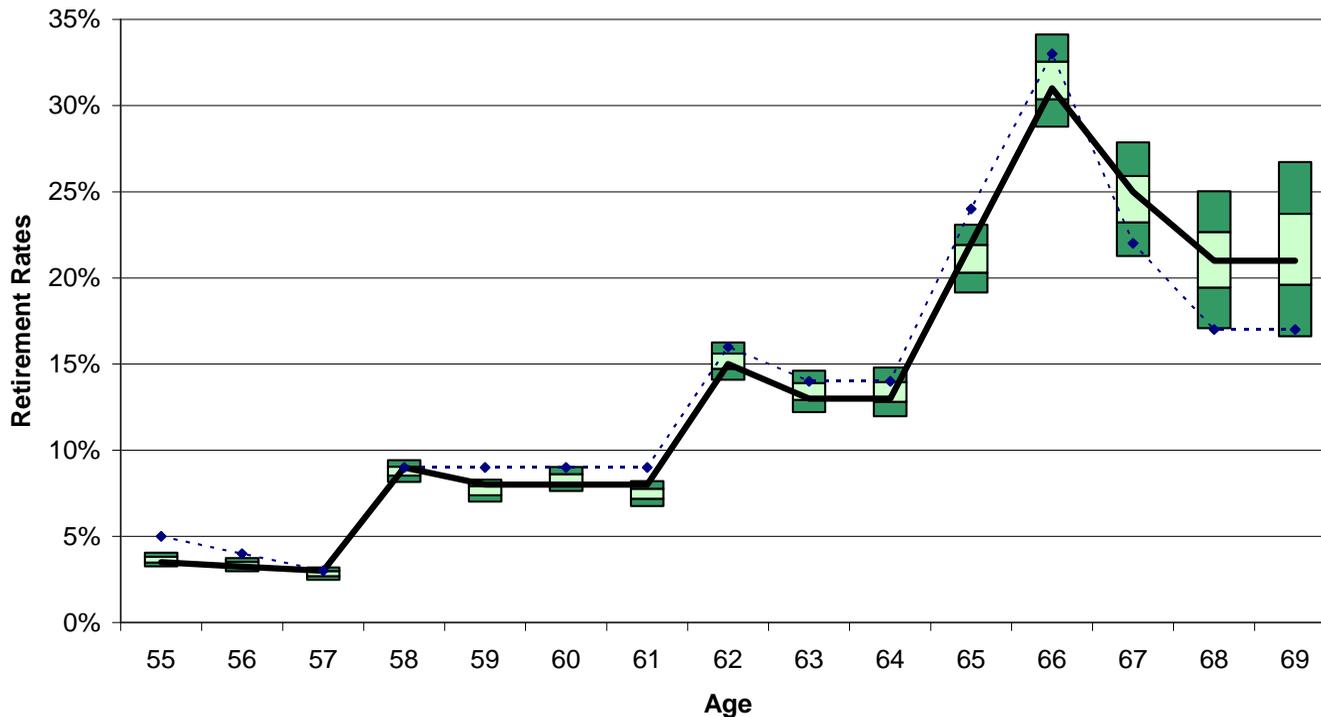


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 - Social Security
 - Prior employment
 - Spousal benefits
 - Savings

Appendix

Retirement Rates – General Service with 15 to 29 Years of Service

Tier 1/Tier 2 - Other General Service Members with 15 - 29 Years of Service

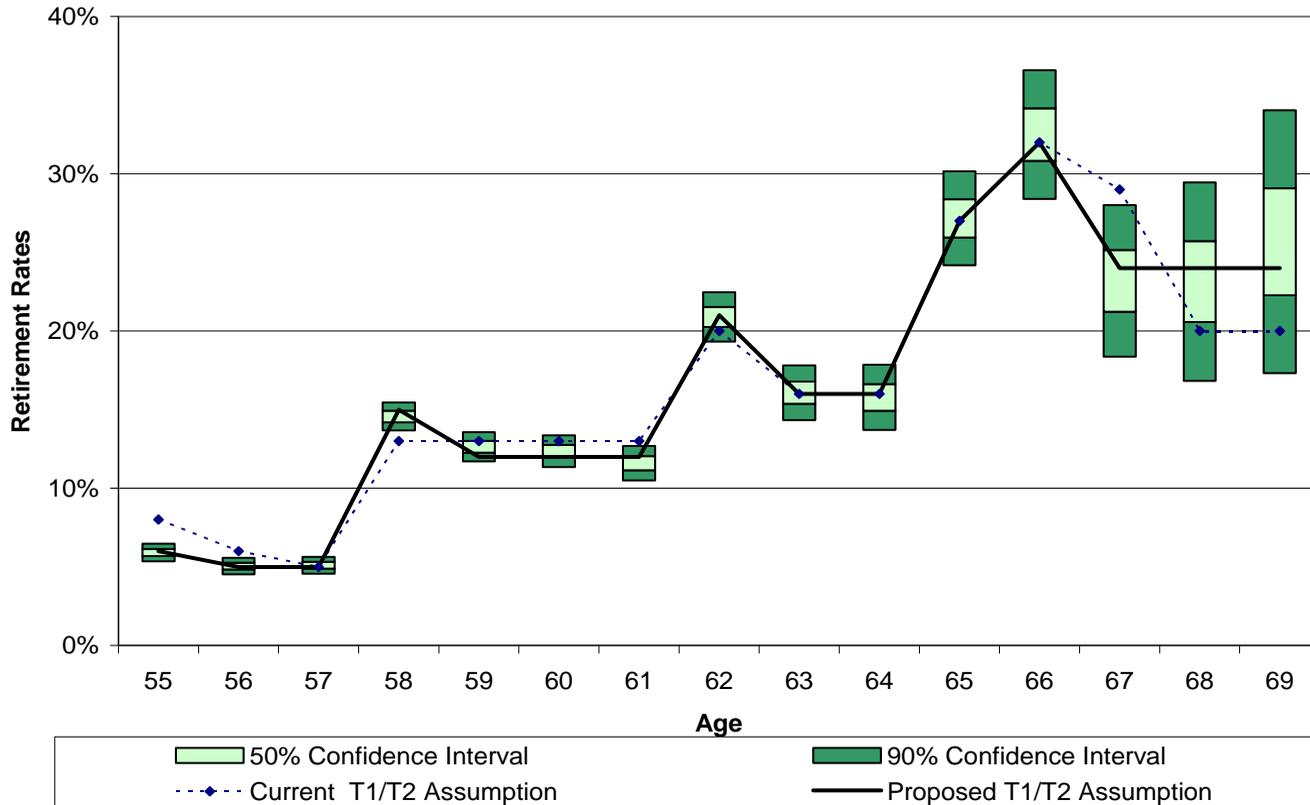


- Retirement decisions by members with 15 to 29 years of service are likely to be influenced by the structure of PERS benefits as well as the availability of other resources, including:
 - Social Security
 - Prior employment
 - Spousal benefits
 - Savings

Appendix

Retirement Rates – General Service with 15 to 29 Years of Service

Tier 1/Tier 2 - School Districts
Members with 15 - 29 Years of Service



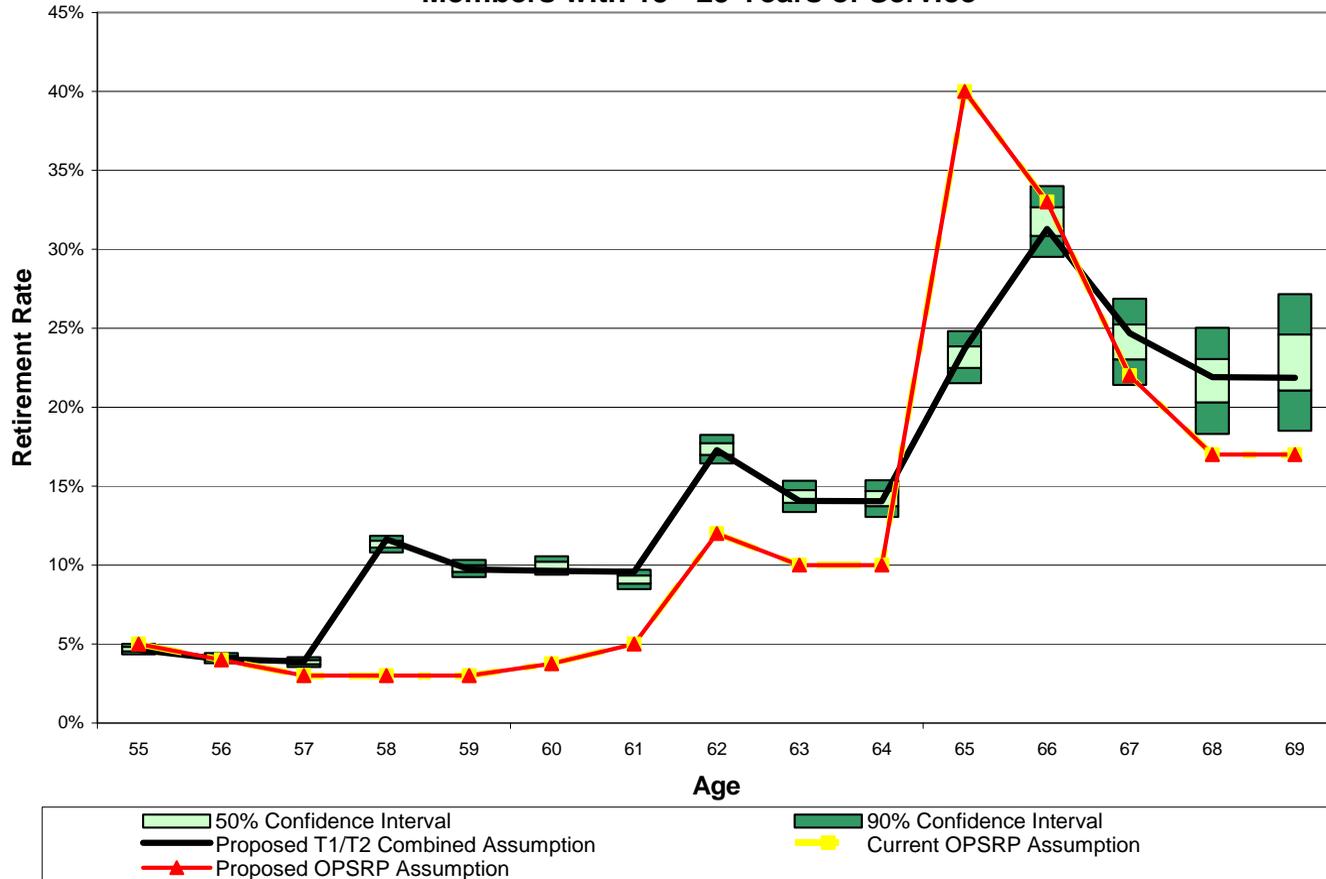
- Retirement decisions by members with 15 to 29 years of service are likely to be influenced by the structure of PERS benefits as well as the availability of other resources, including:
 - Social Security
 - Prior employment
 - Spousal benefits
 - Savings
- Charts for additional groups can be found in the appendix.

Appendix

Retirement Rates – General Service with 15 to 29 Years of Service

OPSRP - General Service

Members with 15 - 29 Years of Service

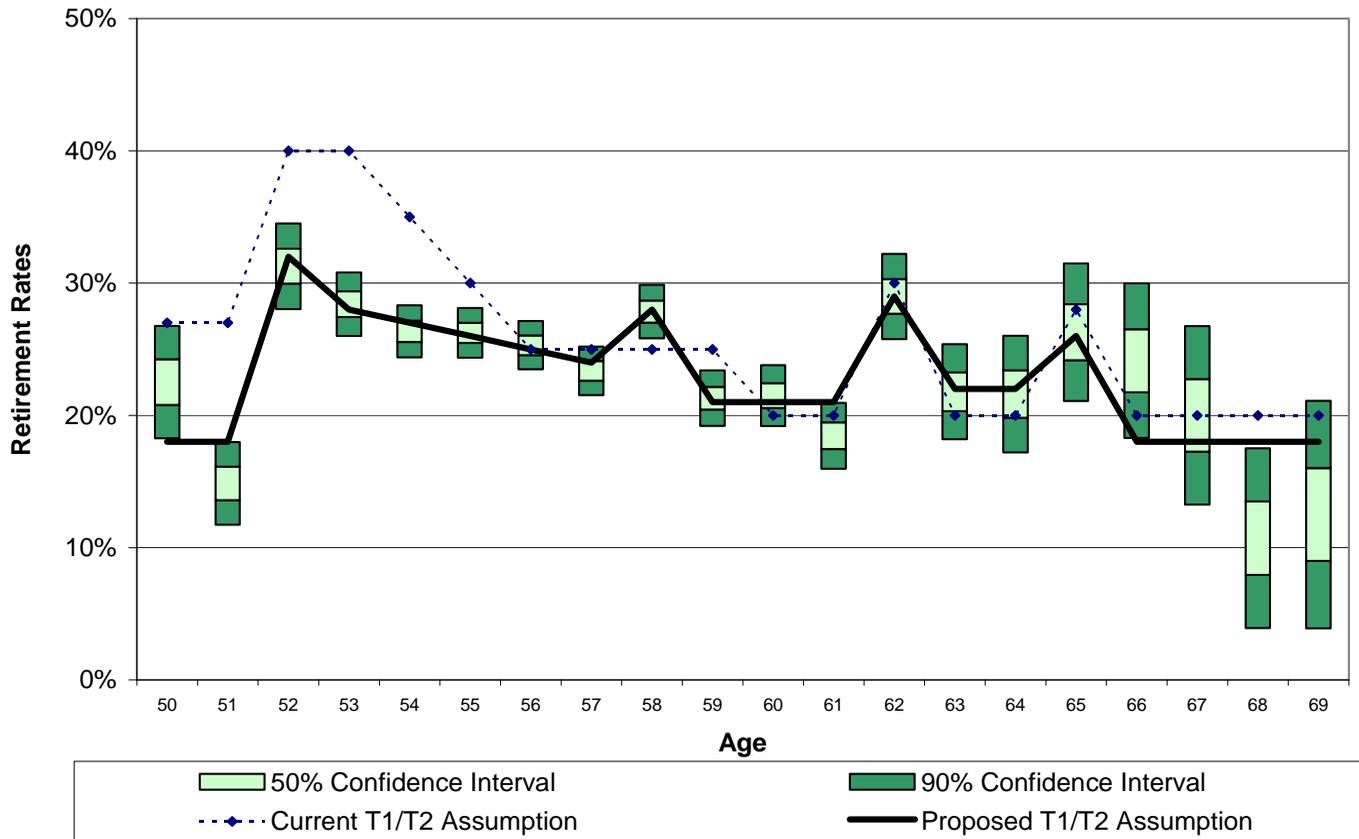


- Retirement decisions by members with 15 to 29 years of service are likely to be influenced by the structure of PERS benefits as well as the availability of other resources, including:
 - Social Security
 - Prior employment
 - Spousal benefits
 - Savings

Appendix

Retirement Rates – General Service with 30 or More Years of Service

General Service/School District
Members with 30+ Years of Service

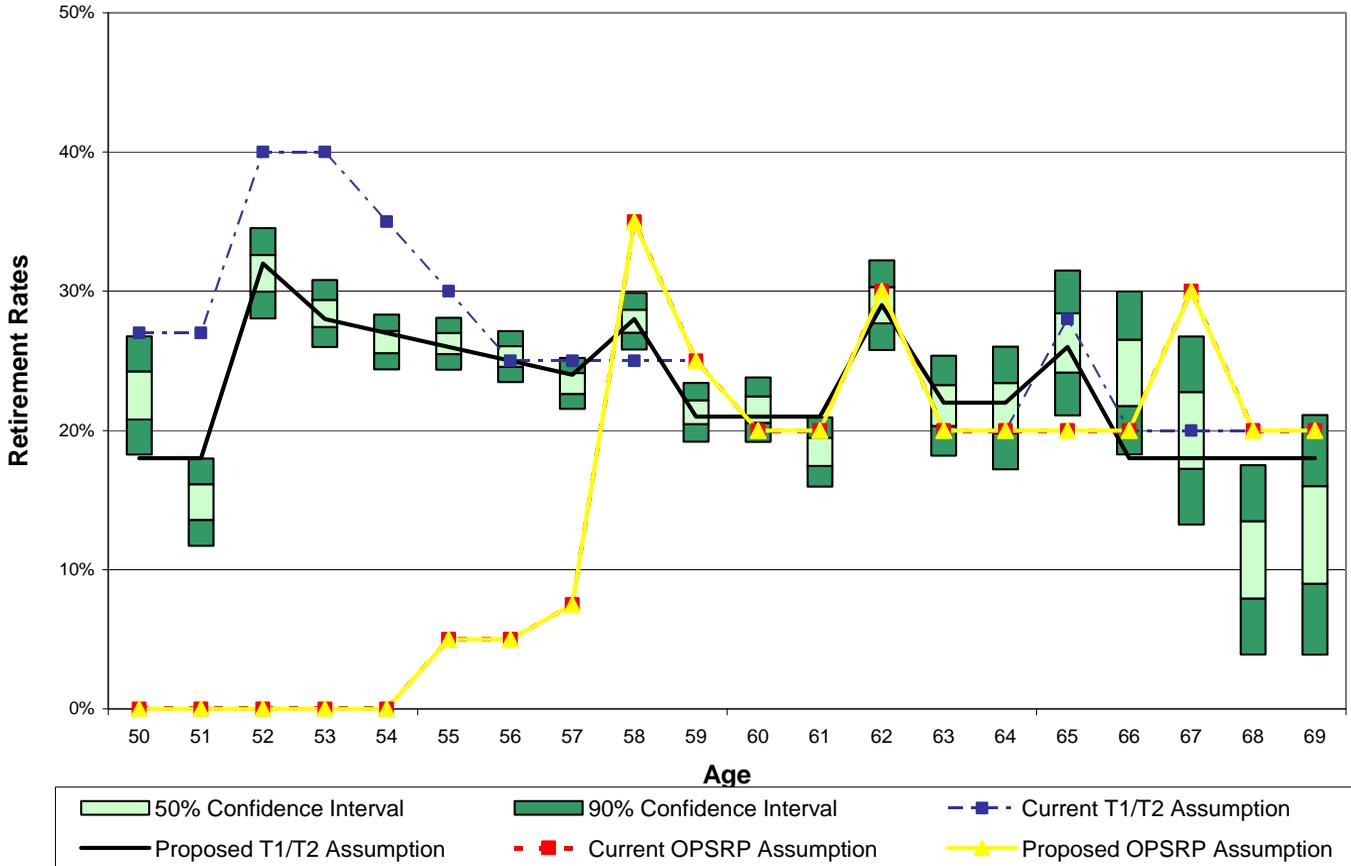


- Retirement decisions by members with 30 or more years of service are heavily influenced by the immediate unreduced benefits available through PERS (after age 58 for OPSRP benefits)
- There has been a continued decline in retirements among this group at the earliest ages, possibly due to the decline in average replacement income from Money Match benefits over the last 7 years

Appendix

Retirement Rates – General Service with 30 or More Years of Service

General Service
Members with 30+ Years of Service

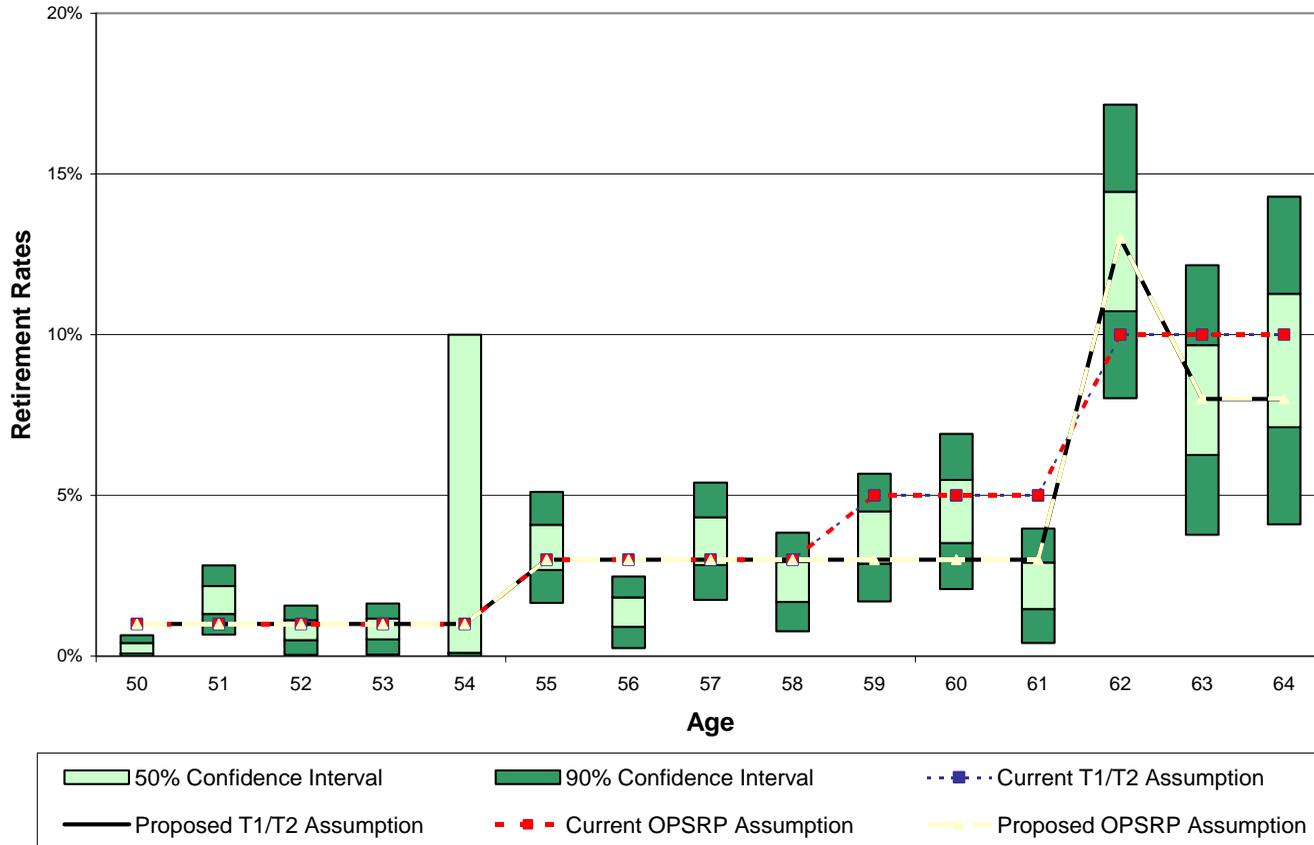


- Retirement decisions by members with 30 or more years of service are heavily influenced by the immediate unreduced benefits available through PERS (after age 58 for OPSRP benefits)
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Appendix

Retirement Rates – Police & Fire with less than 13 Years of Service

Police & Fire Members
Members with less than 13 Years of Service



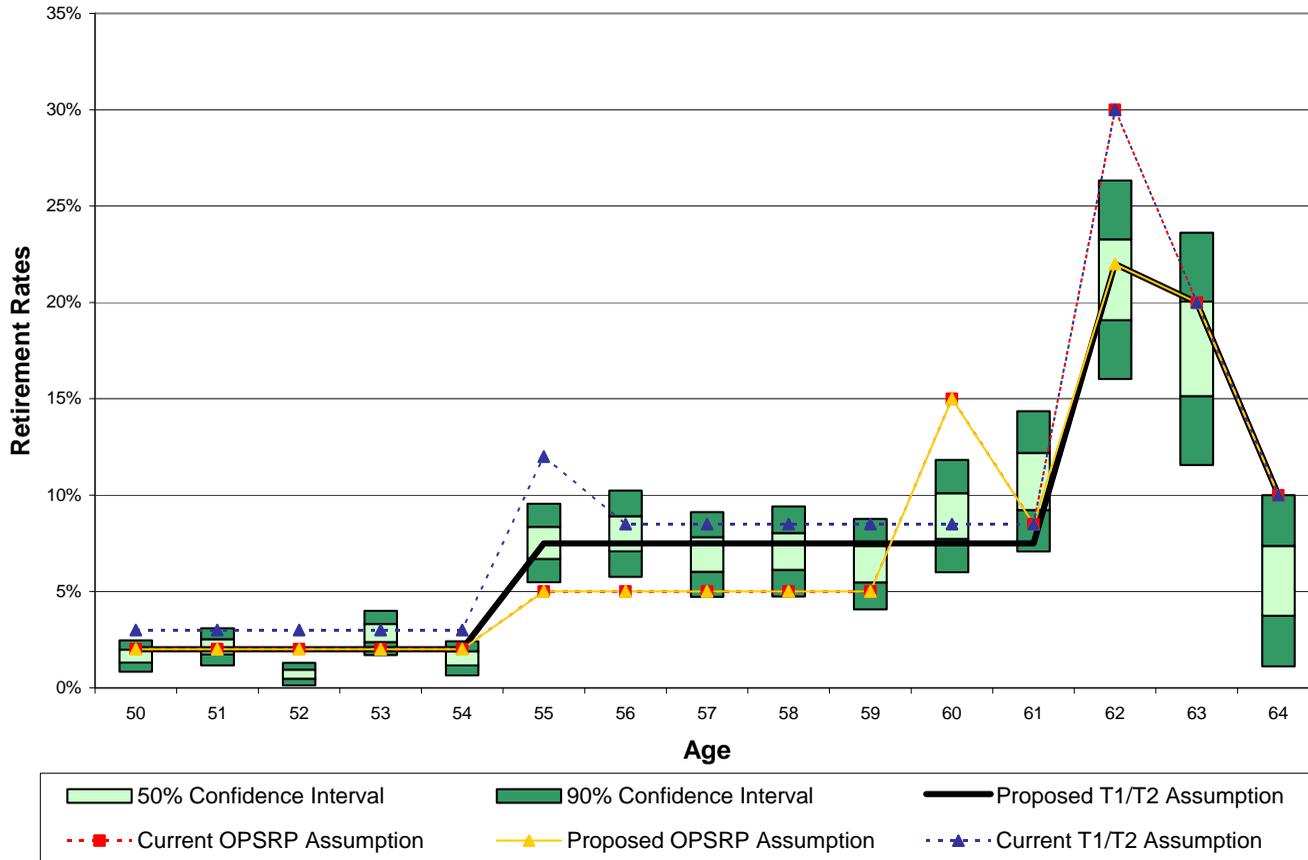
- Retirement decisions by members with less than 13 years of service are likely to be heavily influenced by the availability of resources other than PERS benefits, including:
 - Social Security
 - Prior employment
 - Spousal benefits
 - Savings

Appendix

Retirement Rates – Police & Fire with 13 to 24 Years of Service

Police & Fire Members

Members with 13 to 24 Years of Service

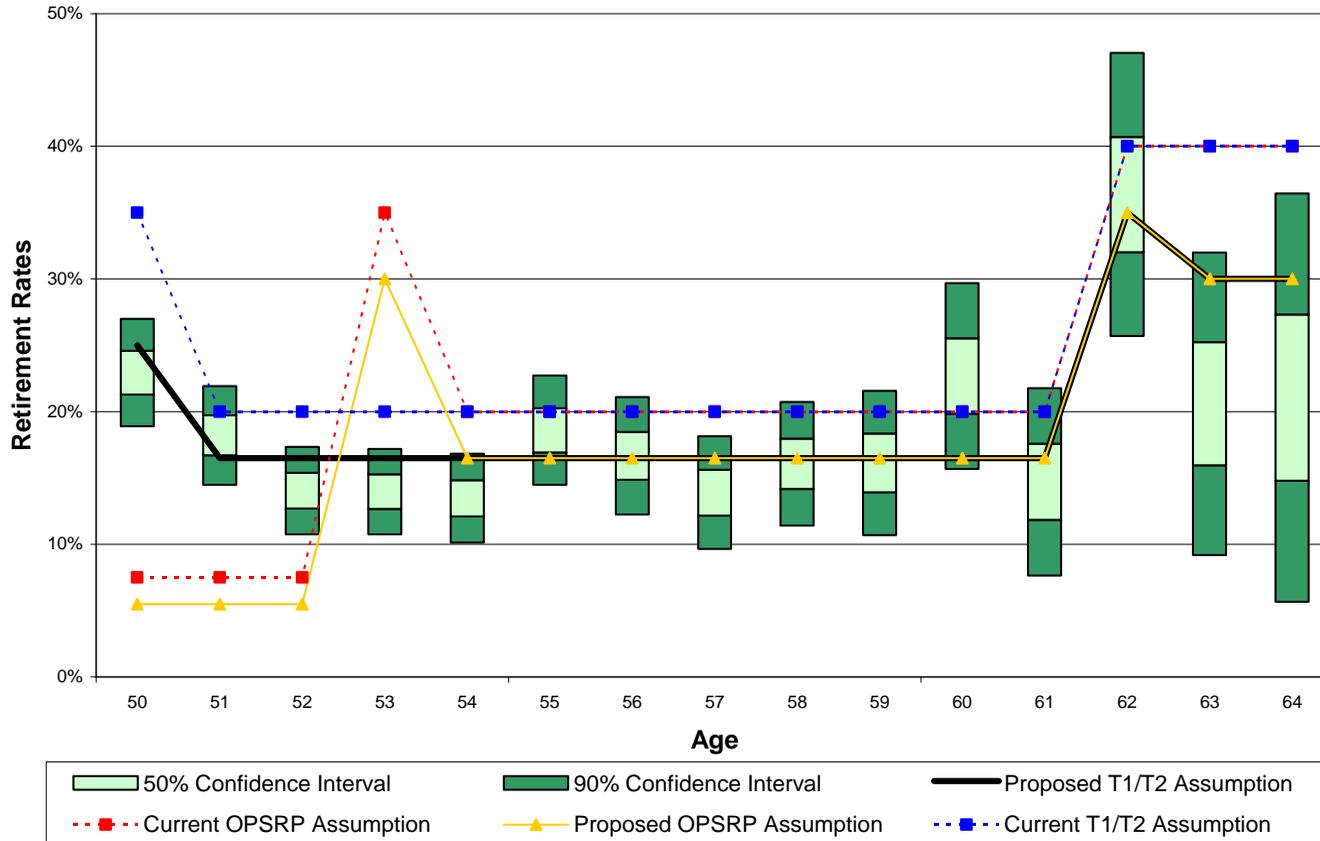


- Retirement rates for members with more than 12 years of service are influenced by the availability of unreduced benefits
- Since there is no reliable OPSRP data, OPSRP assumptions are based on the Tier 1 / Tier 2 patterns and judgments about how the different normal retirement age will affect retirement rates

Appendix

Retirement Rates – Police & Fire with 25 or More Years of Service

Police & Fire Members Members with 25+ Years of Service

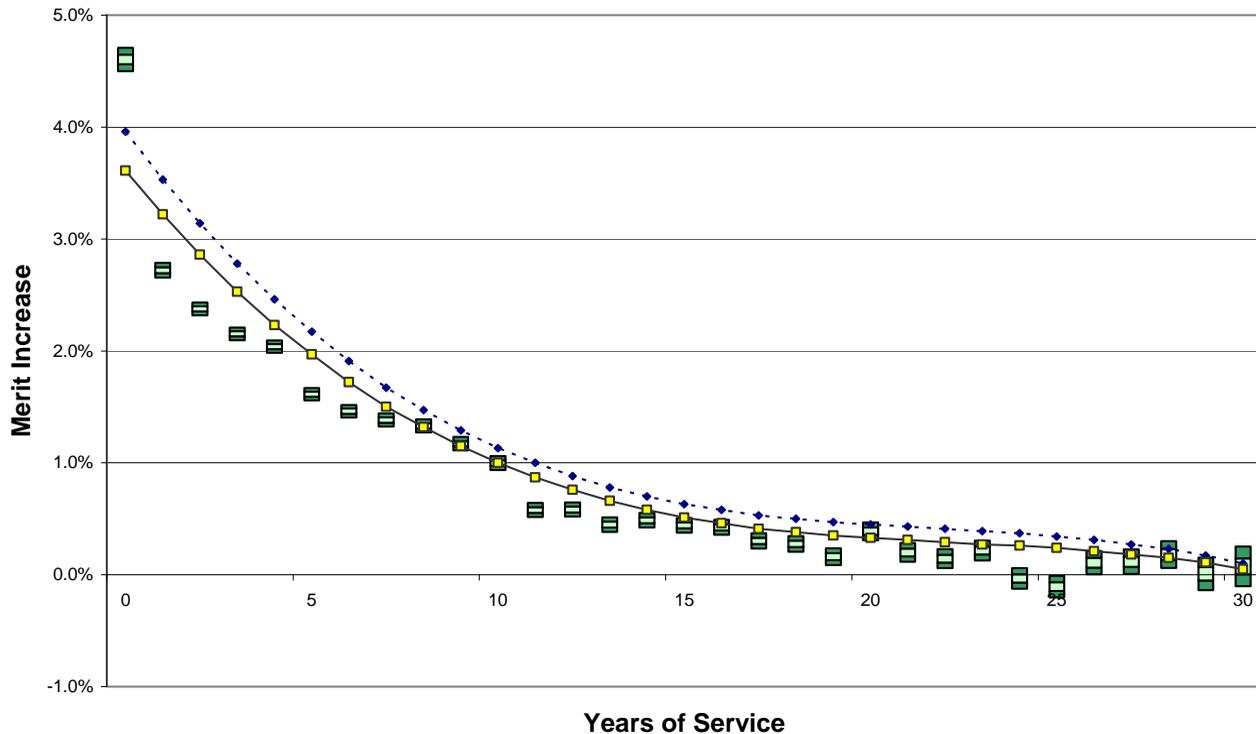


- Retirement rates for members with 25 or more years of service are influenced by the availability of unreduced benefits
- Since there is no reliable OPSRP data, OPSRP assumptions are based on the Tier 1 / Tier 2 patterns and judgments about how the different normal retirement age will affect retirement rates

Appendix

Merit Salary Increases

Other General Service



50% Confidence Interval
 90% Confidence Interval
 Current Assumption
 Proposed Assumption

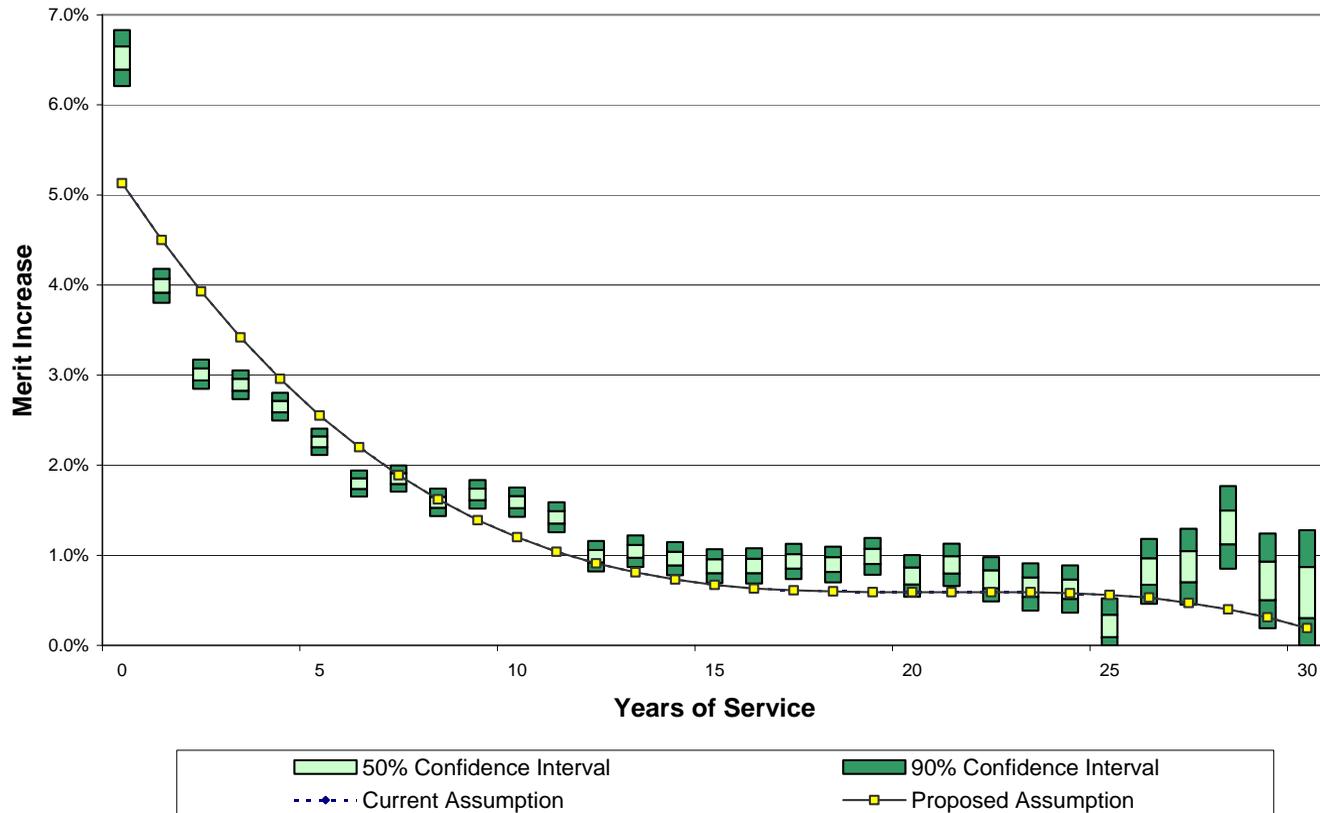
For the merit scale, we studied experience from 2003 through 2010.

- Merit increases are added to inflation and general productivity to arrive at a total salary increase assumption
- Current assumptions set for three groups:
 - School Districts (SD)
 - Other General Service (Other GS)
 - Police & Fire (PF)
- Proposed changes:
 - Decrease Merit Scale modestly for School Districts members with more than 10 years of service.
 - Decrease Merit Scale for Other GS slightly
 - Maintain Merit Scale for PF

Appendix

Merit Salary Increases

Police & Fire



For the merit scale, we studied experience from 2003 through 2010.

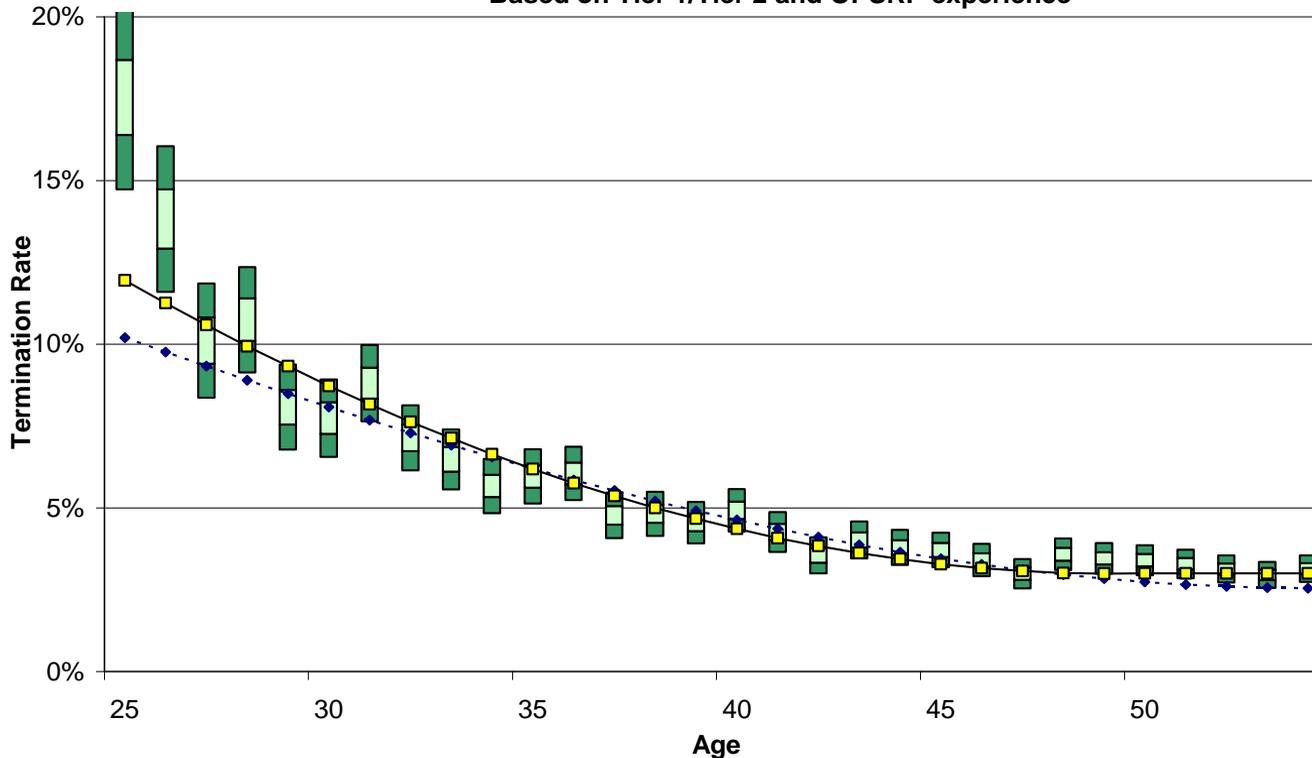
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 - School Districts (SD)
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 - Decrease Merit Scale for Other GS slightly
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Appendix

Ultimate Termination Rates

Other General Service Male - OPSRP

Based on Tier 1/Tier 2 and OPSRP experience



- Structure changes:
 - Separate rates for T1/T2 and OPSRP
 - Consolidate rates for SLGRP and Independent Employers

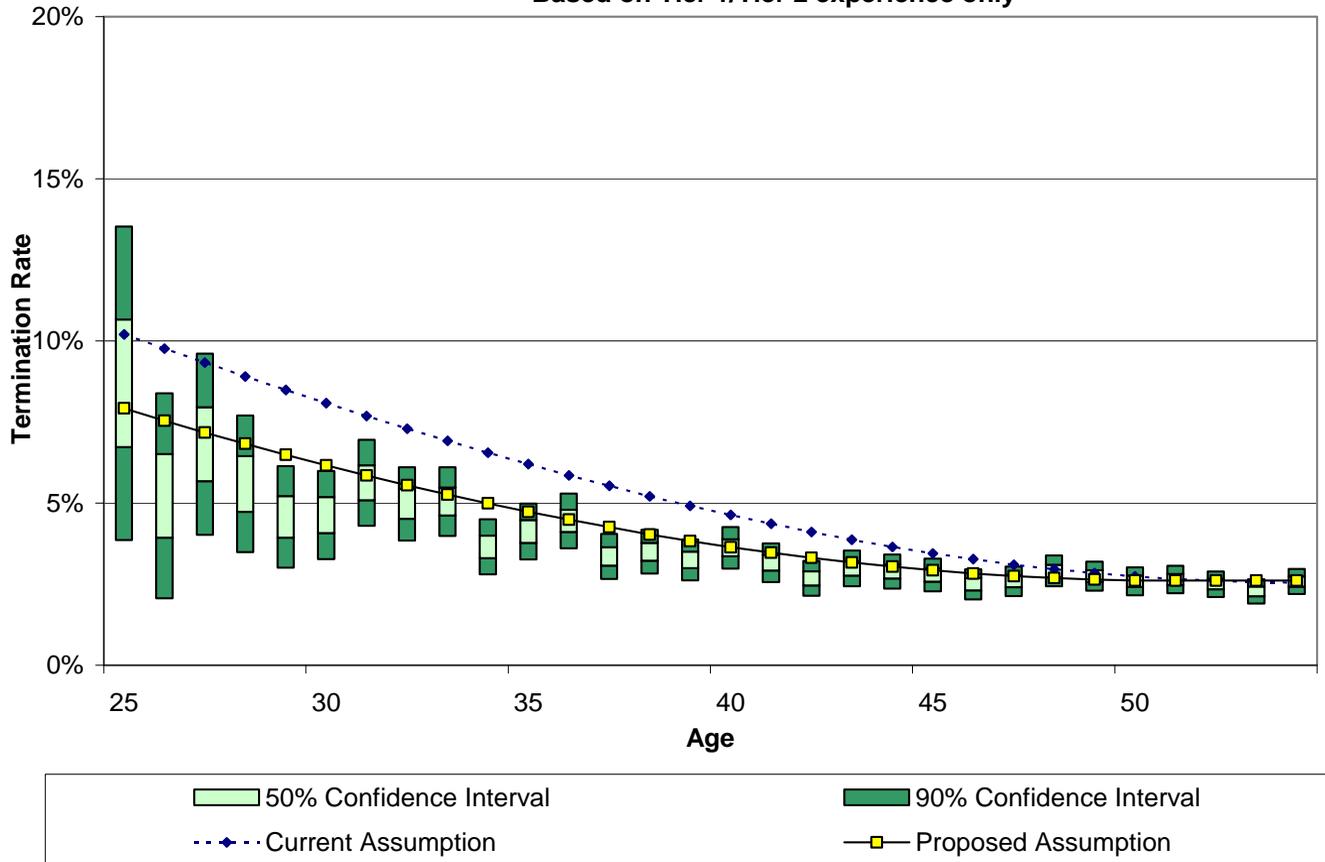
- Adjustments to ultimate termination rates:
 - Modest upward adjustment for School Districts – OPSRP
 - Modest decrease for Other General Service – T1/T2
 - Minor changes for Other General Service – OPSRP
 - No changes for Police & Fire

Appendix

Ultimate Termination Rates

Other General Service Male - Tier 1/Tier 2

Based on Tier 1/Tier 2 experience only



- Structure changes:
 - Separate rates for T1/T2 and OPSRP
 - Consolidate rates for SLGRP and Independent Employers

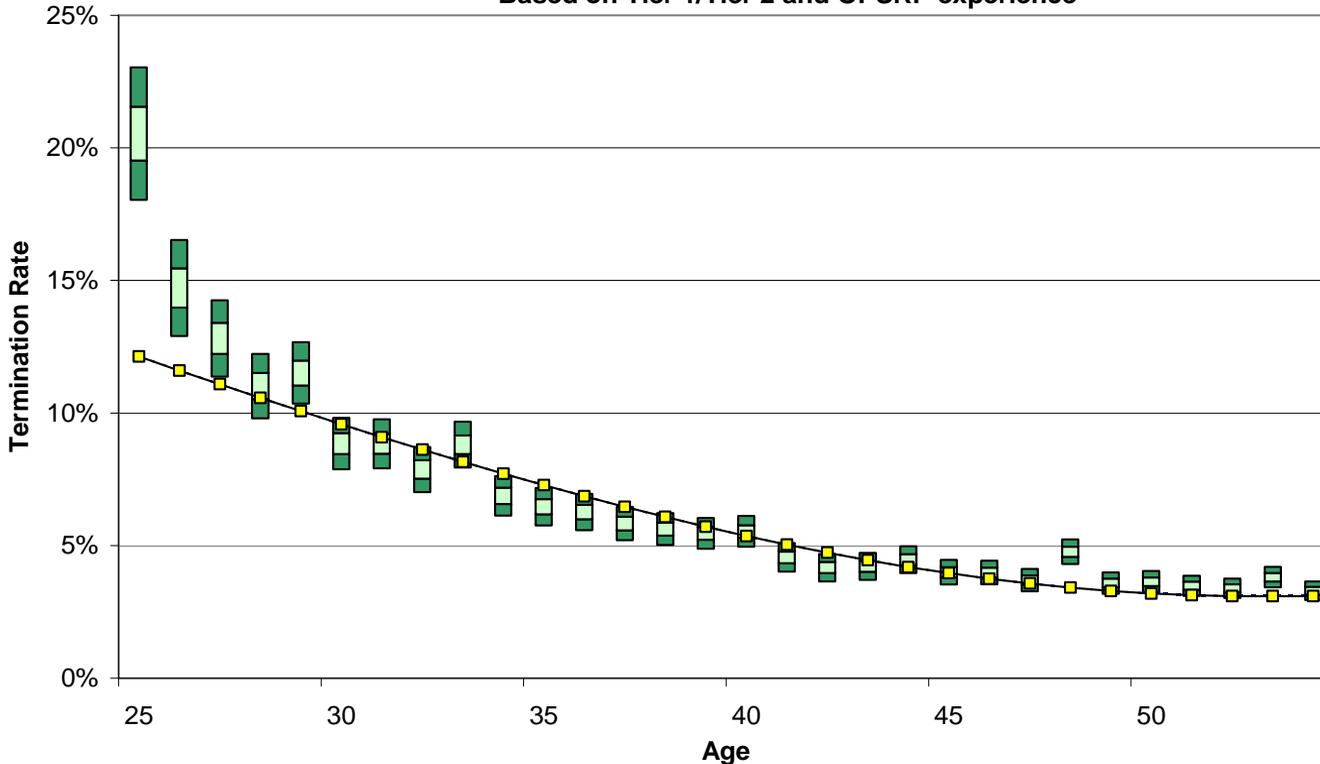
- Adjustments to ultimate termination rates:
 - Modest upward adjustment for School Districts – OPSRP
 - Modest decrease for Other General Service – T1/T2
 - Minor changes for Other General Service – OPSRP
 - No changes for Police & Fire

Appendix

Ultimate Termination Rates

Other General Service Female - OPSRP

Based on Tier 1/Tier 2 and OPSRP experience



- Structure changes:
 - Separate rates for T1/T2 and OPSRP
 - Consolidate rates for SLGRP and Independent Employers

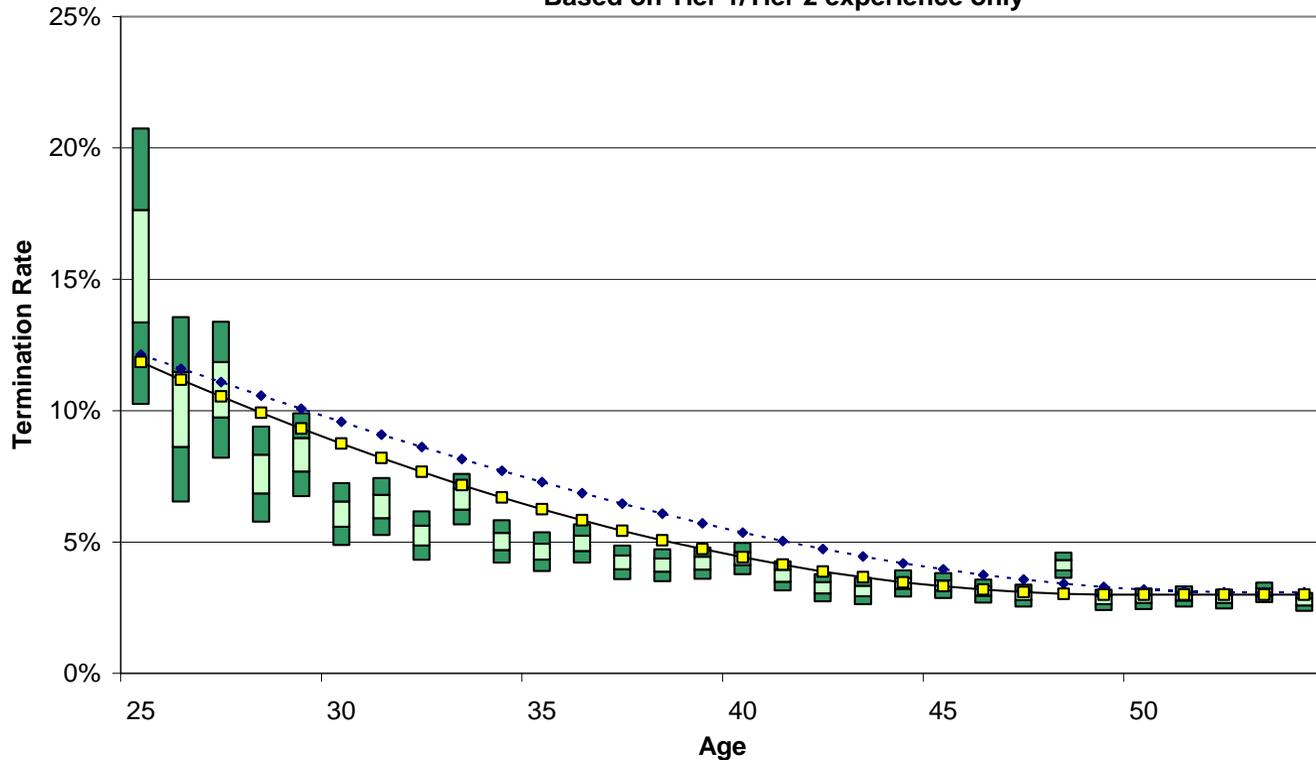
- Adjustments to ultimate termination rates:
 - Modest upward adjustment for School Districts – OPSRP
 - Modest decrease for Other General Service – T1/T2
 - Minor changes for Other General Service – OPSRP
 - No changes for Police & Fire

Appendix

Ultimate Termination Rates

Other General Service Female - Tier 1/Tier 2

Based on Tier 1/Tier 2 experience only



- Structure changes:
 - Separate rates for T1/T2 and OPSRP
 - Consolidate rates for SLGRP and Independent Employers

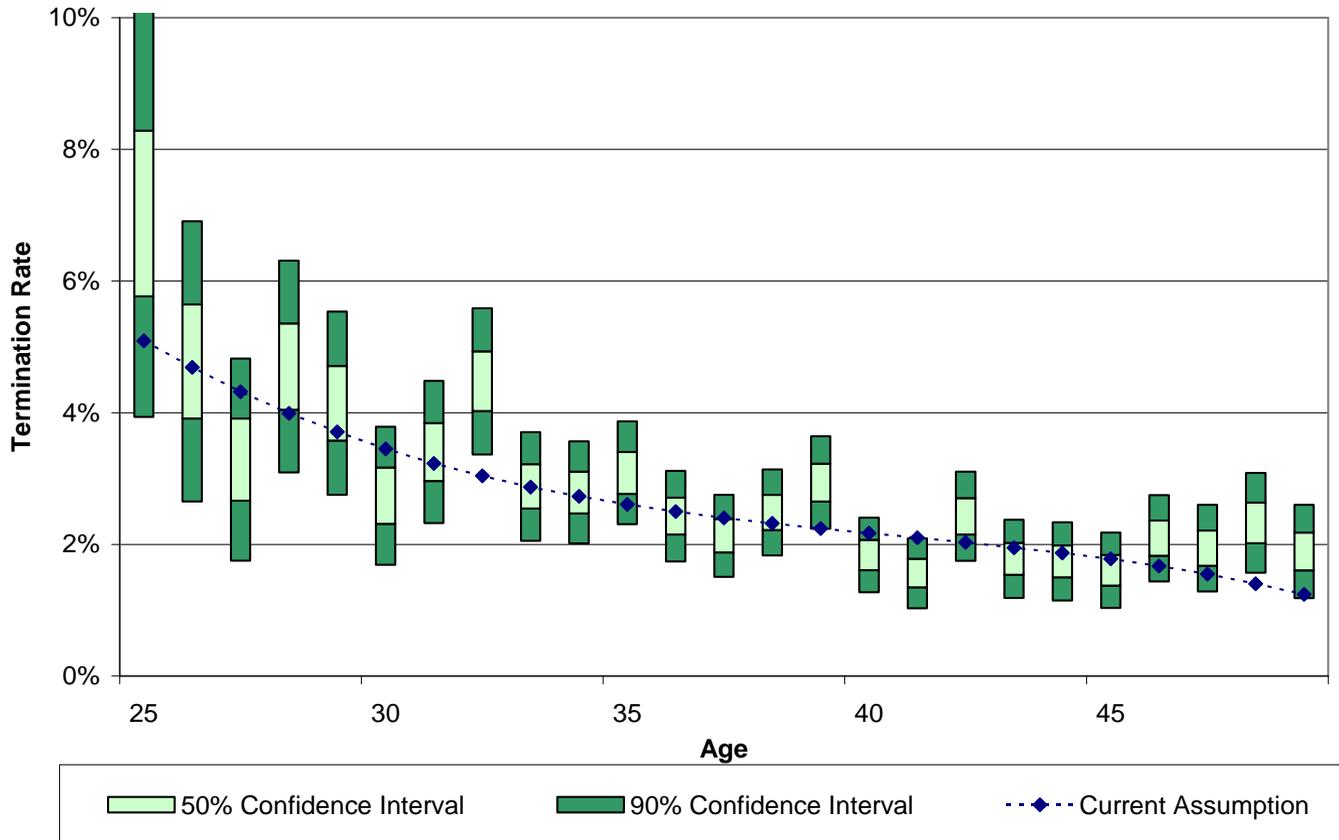
- Adjustments to ultimate termination rates:
 - Modest upward adjustment for School Districts – OPSRP
 - Modest decrease for Other General Service – T1/T2
 - Minor changes for Other General Service – OPSRP
 - No changes for Police & Fire

Appendix

Ultimate Termination Rates

Police & Fire - OPSRP

Based on Tier 1/Tier 2 and OPSRP experience



- Structure changes:
 - Separate rates for T1/T2 and OPSRP
 - Consolidate rates for SLGRP and Independent Employers

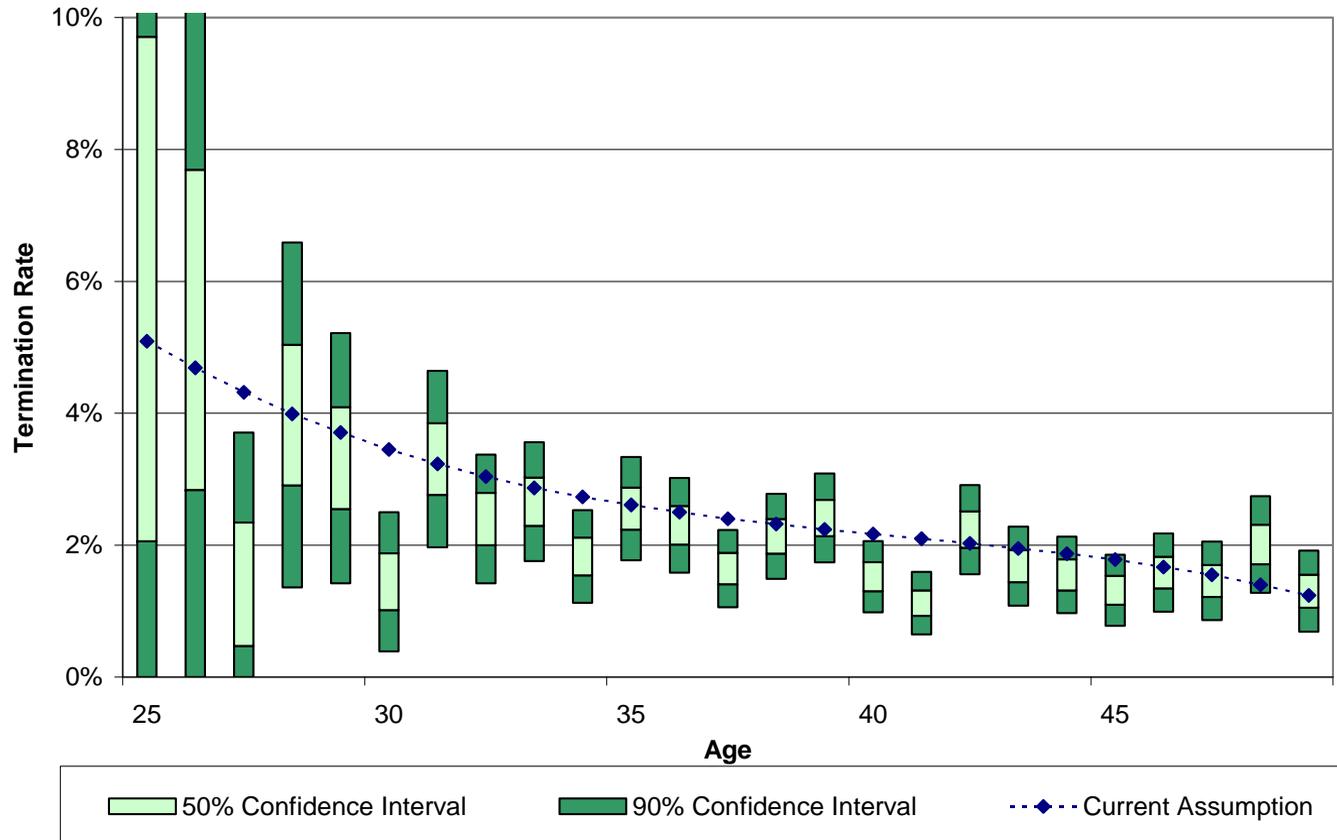
- Adjustments to ultimate termination rates:
 - Modest upward adjustment for School Districts – OPSRP
 - Modest decrease for Other General Service – T1/T2
 - Minor changes for Other General Service – OPSRP
 - No changes for Police & Fire

Appendix

Ultimate Termination Rates

Police & Fire - Tier 1/Tier 2

Based on Tier 1/Tier 2 experience only



- Structure changes:
 - Separate rates for T1/T2 and OPSRP
 - Consolidate rates for SLGRP and Independent Employers

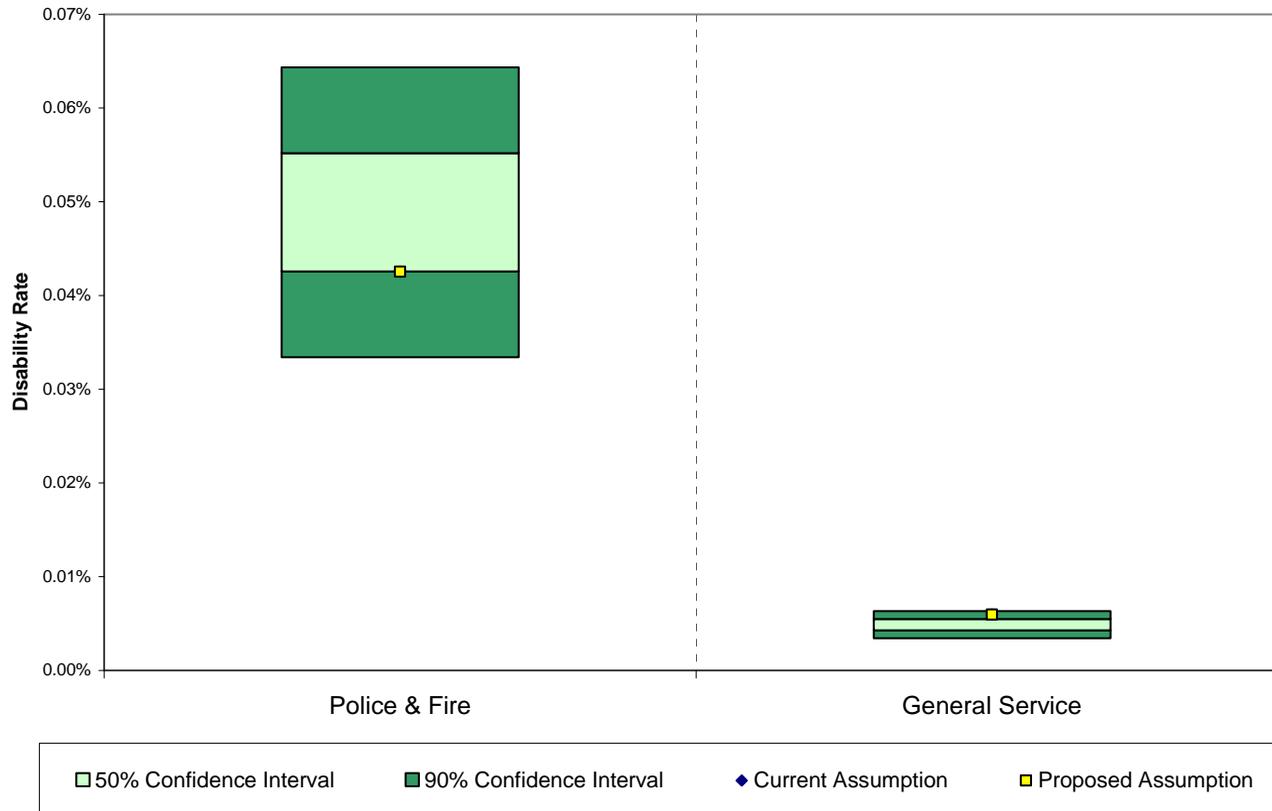
- Adjustments to ultimate termination rates:
 - Modest upward adjustment for School Districts – OPSRP
 - Modest decrease for Other General Service – T1/T2
 - Minor changes for Other General Service – OPSRP
 - No changes for Police & Fire

Appendix

Duty Disability Incidence

Duty Disability Incidence

Aggregate Confidence Intervals and Rates



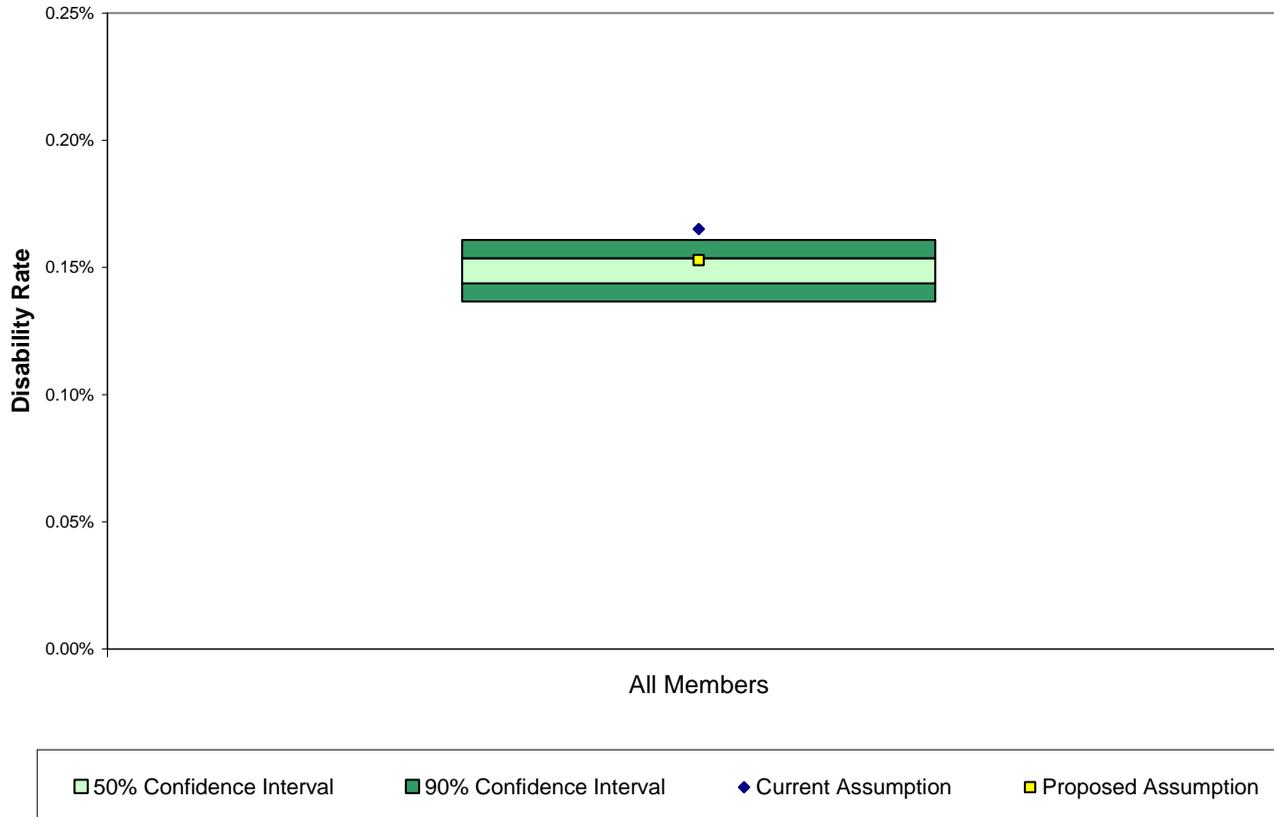
- Duty disability rates remained fairly level since the prior study.
- We propose no changes to the current duty disability incidence tables

Appendix

Ordinary Disability Incidence

Ordinary Disability Incidence

Aggregate Confidence Intervals and Rates

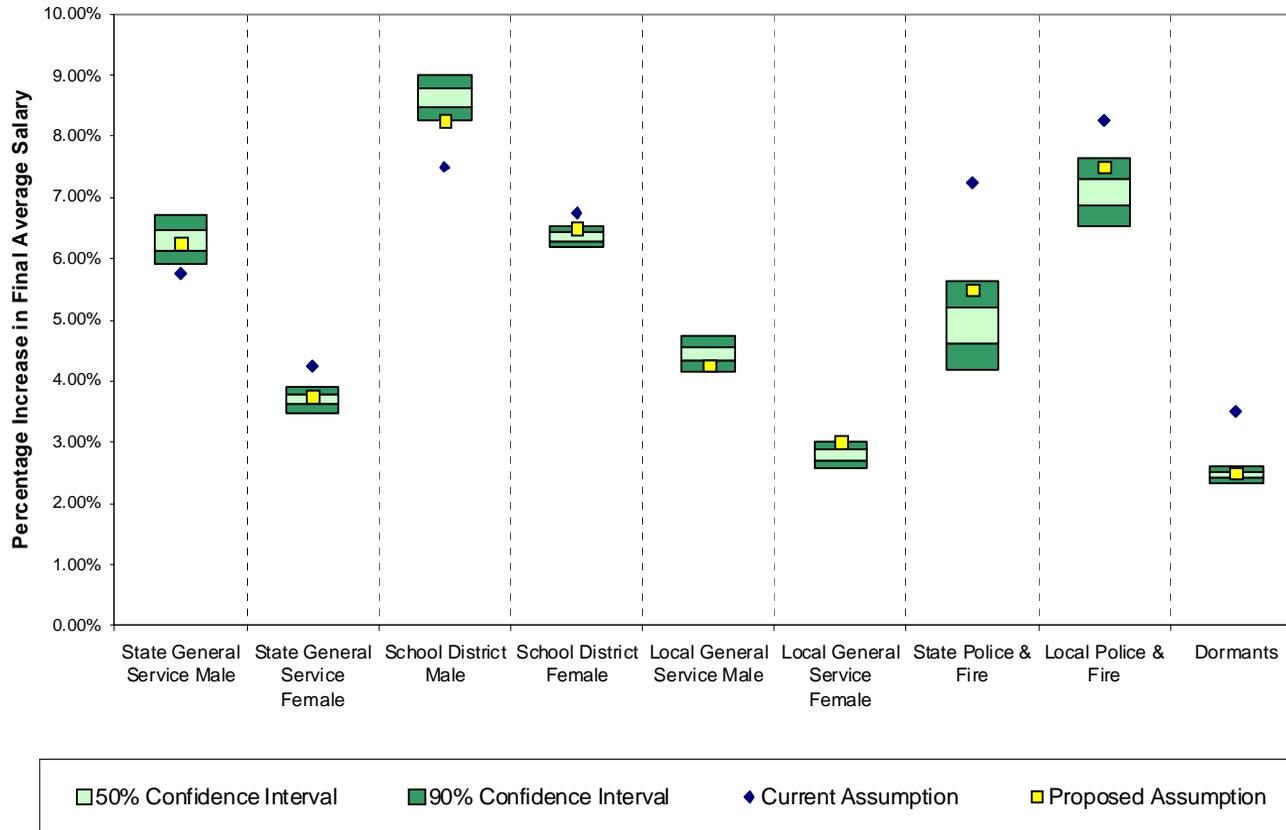


- Ordinary disability rates have declined slightly since the prior study.
- We propose adjusting the current table slightly so the assumption falls within the aggregate confidence interval.

Appendix

Unused Sick Leave

Unused Sick Leave



- Based on recent experience, we propose adjusting rates for State General Service, School District, State and Local Police & Fire, and Dormants.
- For members that have the ability to include unused sick leave, the final average pay calculated without sick leave is increased by the percentages shown at left to model the effects of sick leave

Appendix

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 is determined under Full Formula, electing a total lump sum may cause the member to give up a substantial portion of the benefit.
- Consequently, the assumption phases 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 LS	843	5.76%	6.00%
Total LS	912	6.23%	6.25%*
Annuity	12,881	88.01%	87.75%*
Total Elections	13,639	100%	100%

* "Total" lump sum elections are assumed to decrease 0.5% per year. Amount shown is the average over the experience study period.

Lump Sum Election	Proposed Assumption
Partial LS	No Change
Total LS	No Change 5% for 2011, declining by 0.5% per year until reaching 0.0%

Appendix

Purchase of Credited Service

- For Money Match retirements, purchasing service credits is roughly cost neutral to the system, so no assumption is proposed for Money Match benefits.

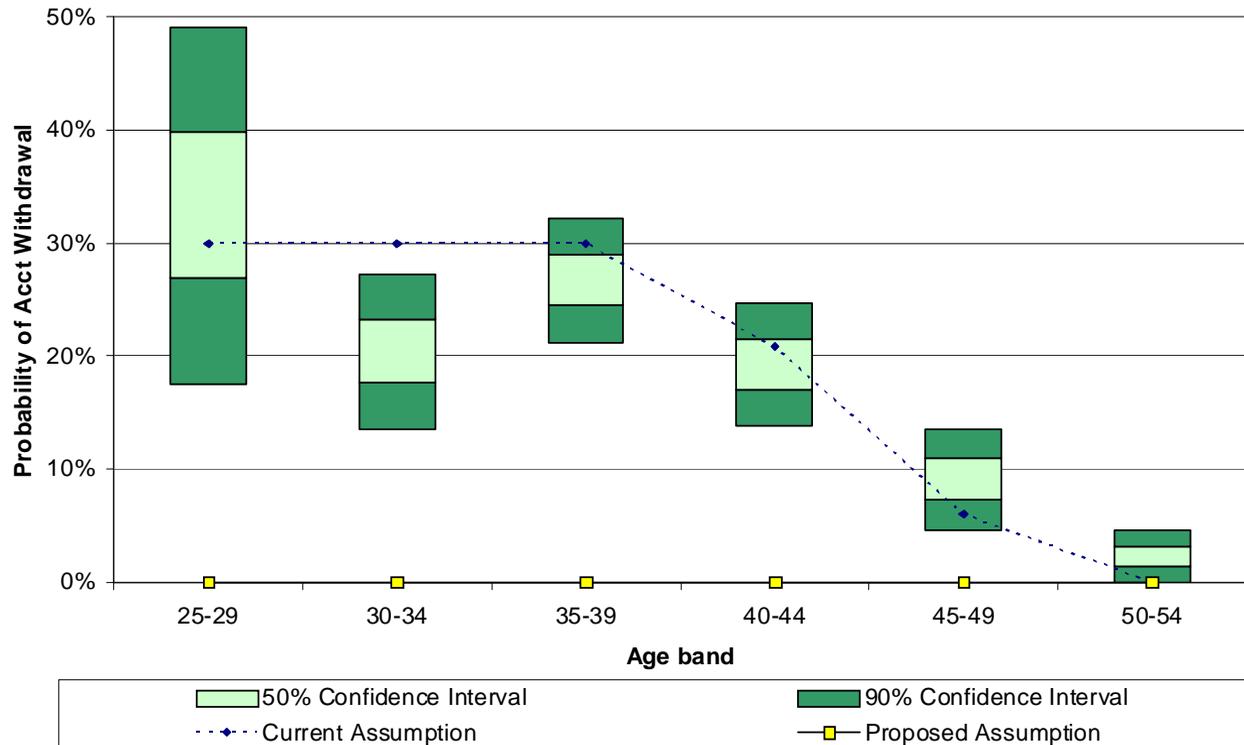
	Count	Number Electing to Purchase Service	Actual %	Current Assumption
Money Match Retirements	3,174	1,149	36%	0%
Non-Money Match Retirements	2,403	1,413	59%	55%

- We propose increasing the assumed percentage of non-Money Match retirees that elect to purchase service to 60%.

Appendix

Probability of Account Withdrawal

Police and Fire



- This assumption represents the probability that a dormant member will withdraw his/her account balance from the plan before retirement.
- We propose eliminating this assumption going forward, that is assuming no one withdraws their account balance.

Actuarial Methods

Treatment of Negative Rate Guarantee Reserve

- The value of assets used to determine employer contribution rates has historically excluded any assets in the Contingency, Capital Preservation, or Rate Guarantee Reserves

Valuation Assets = Market Assets - Reserves

- The Rate Guarantee Reserve (RGR) is currently negative (a deficit reserve), as it was for the 12/31/2008 and 12/31/2009 valuations
 - As confirmed by the Board in May 2009, the reserve was excluded in these valuations while it has been in deficit
 - In essence, the negative reserve was treated as an asset
 - All else equal, treating a negative reserve as an asset increases valuation assets used for contribution rate calculations
 - If the negative reserve is larger than the sum of the positive reserves, then valuation assets would exceed the fair value of assets using this approach
- We think it is prudent for the Board to periodically evaluate this issue and either reconfirm the current approach or specify any desired changes

Actuarial Methods

Treatment of Negative Rate Guarantee Reserve (continued)

- Rationale for treating a negative reserve as an asset:
 - We understand that if a deficit persists for five years, action is required to restore the reserve
 - If a separate mechanism is established to restore the reserve, then treating the negative reserve as an asset would avoid double-charging for the associated deficit
- Rationale for not adjusting valuation assets for a negative reserve (i.e., not treating it as an asset):
 - It avoids the potential for valuation assets to exceed fair value of assets
 - The reserve restoration mechanism is not currently well-defined
 - Not adjusting for a negative reserve would increase calculated contribution rates. The higher rate so calculated could be a good budgeting proxy for the reserve restoration cost once a restoration mechanism is defined.
- As a policy choice, the Board could distinguish between treatment when the RGR is negative in isolation versus when sum of RGR, Contingency, and Capital Preservation is negative

Actuarial Methods

Treatment of Negative Rate Guarantee Reserve (continued)

- When reserves are positive, their treatment is straightforward
 - Reserves are excluded from valuation assets for rate-setting calculations as they are earmarked for a specific purpose different than general benefit payments
- When a reserve (such as the Rate Guarantee Reserve) is negative, there are various possible ways to treat the negative reserve
 - Alternative #1 (current method): Always treat the negative reserve as an asset
 - If the negative reserve is large, the net sum of all reserves could be negative, leading to valuation assets exceeding fair market value
 - Alternative #2: Never treat the negative reserve as an asset
 - The entire negative Rate Guarantee Reserve is essentially treated as part of the Unfunded Actuarial Liability (UAL) with this approach
 - Alternative #3: Never allow the sum of the excluded reserves to be negative
 - With this approach, valuation assets will never exceed reported market value. A negative Rate Guarantee Reserve would be treated as an asset only to the extent it does not exceed, for example, the amount of the Contingency Reserve.

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