WASHINGTON STATE LEGISLATURE

Office of the State Actuary

September 12, 2006

Sent via e-mail and campus mail

TO: **Pension Funding Council Members**
Senator Margarita Prentice, Chair
        Ways and Means Committee
Senator Joseph Zarelli, Ranking Minority Member
        Ways and Means Committee
Representative Helen Sommers, Chair
        Appropriations Committee
Representative Gary Alexander, Ranking Minority Member
        Appropriations Committee
Ms. Sandra Matheson, Director
        Department of Retirement Systems
Mr. Victor Moore, Director
        Office of Financial Management

FROM: Matthew M. Smith, FCA, EA, MAAA
State Actuary

RE: **NOTICE OF RATE CHANGES IN RESPONSE TO ACTUARIAL AUDIT**

This letter is intended to supplement my letter to you dated August 22, 2006, "Preliminary 2007-09 Pension Contribution Rates." I have considered comments from the actuarial auditor, Oliver Consulting, dated August 23, 2006. In response to those comments, I have slightly adjusted my position on mortality assumptions. The purpose of this letter is to explain the adjustment and provide additional information to the Council.

Background

As I mentioned to you in my presentation dated August 23, 2006, contribution rates for the 2007-2009 biennium reflect increases that are due in part to recognition of future mortality improvement. As stated by the actuarial auditor, this change is in line with current trends in practice in that it presents a picture of the systems' liabilities that is more accurate because it recognizes the likelihood of future mortality improvement.

Prior to the preliminary results of the 2005 actuarial valuation, pension contribution rates were calculated using "static" mortality tables, meaning the mortality assumptions did not include future mortality improvements. Rates were also calculated using "combined" mortality tables, meaning there were no separate mortality rates for employees and healthy annuitants. The preliminary results that I presented to you on August 23, 2006, included both changes: (1) projected mortality and (2) "non-combined" or separate mortality tables.

The actuarial auditor has commented that generally, mortality assumptions are reviewed in an experience study, but also noted that it is not inappropriate to implement such changes independently. In considering the auditor's comments, I am mindful of the distinction between mortality assumptions that are plan-specific and mortality assumptions that are population-based. I have also considered the actuarial standards of practice, as well as recommendations from within the actuarial profession. I have concluded that the change to projected mortality is appropriately made at this point in time, independent of plan-specific experience studies. However, with respect to the use of "non-combined" or separate mortality tables, I have concluded that it would be more appropriate to defer this change until all plan-specific data can be considered as a whole. For your information, I will discuss each of these two aspects of mortality assumptions in more detail below.

Projecting Mortality Improvement

The creators of the Uninsured Pensioners (UP)-94 mortality table, published by the Society of Actuaries (SOA), noted that the trend of mortality improvement has been long and consistent in the U.S. and a preponderance of scientific and demographic literature foresees continued mortality improvement. Furthermore, the creators of the Retirement Plan (RP)-2000 mortality table, also published by the SOA, noted: "… in the view of the long history of improvement in non-disabled mortality rates in all of these sets of data, pension valuations should take trends in long-term mortality improvement into account. From a theoretical standpoint … the use of generational mortality improvement … is an appropriate way of reflecting this improvement …"

The RP-2000 mortality table is updated using projection scale AA, the recommended projection scale within the actuarial profession. This scale was also published by the SOA and is based on Social Security and Civil Service participants' experience from 1977 to 1993.

The following information may provide the Council with a rough idea of the magnitude of the projection scale. For ages under 85, the annual rate of mortality improvement under projection scale AA is banded to be not less than 0.5 percent and not more than 2.0 percent per year. The annual rates of mortality improvement at age 85 and older are smoothed to a value of 0.1 percent at age 100. No projected improvement is assumed for ages over 100. A copy of mortality projection scale AA is attached to the letter for your convenience.

Prior to the 2005 valuation, actuarial software used by the Office of the State Actuary did not support the projection of mortality on a generational basis. The previous software system was developed in the 1970s and was maintained, without significant functional improvements, until the recent conversion to the current system. The new system, implemented in 2006, can easily and fully accommodate a generational projection of mortality improvement.

Separate Mortality Tables

The creators of the RP-2000 mortality table generated separate tables by gender for employees, healthy annuitants and disabled retirees. The authors agreed that "… mortality among the groups [employees and healthy annuitants] differed sufficiently to justify use of separate tables" and "a combined employee and healthy annuitant mortality table was … produced as a more direct comparison to earlier tables and for actuaries to use if a combined table is needed."

The RP-2000 Combined Healthy mortality table was created by combining the underlying employee and healthy annuitant tables and blending the rates over the ages of overlap between the two separate tables. The combination results in lower mortality rates for annuitants over the ages of overlap than the rates in the underlying annuitant mortality table since annuitants experience higher mortality rates than employees at the same ages.

Prior to the results of the 2005 actuarial valuation, pension contribution rates were calculated using a combined mortality table. The preliminary results provided to you on August 23, 2006, followed the recommendation of the authors of the RP-2000 mortality table and used separate employee and healthy annuitant tables. However, upon further consideration I am recommending that the more prudent course of action is to defer this change until all plan-specific experience has been made available and can be considered along with the change to separate tables.

Relevant Actuarial Standards of Practice

Actuarial standards of practice dictate that actuaries review all plan assumptions and certify the appropriateness of each individual assumption for each measurement. In other words, I have a professional obligation to review the assumptions at each annual valuation and make adjustments as necessary.

Section 3.5.3 of Actuaries Standard of Practice Number 35, Selection of Demographic Assumptions and Other Non-Economic Assumptions for Measuring Pension Obligations states: "The Actuary should consider factors such as … the likelihood and extent of mortality improvements into the future" and "the possible use of different mortality assumptions before and after retirement … ."

Recommendations

(1) I would characterize projected mortality improvement, in the context of the 2005 actuarial valuation, as a general population-level assumption, not as a plan-specific demographic assumption. In my judgment, a traditional five- or six-year look-back experience study would be insufficient for purposes of studying mortality improvement in Washington's public plans. Therefore, the change to projected mortality is most appropriately made now in order to more accurately reflect plan liabilities. I have applied 50 percent of projection scale AA to the combined RP-2000 mortality table, for non-disabled lives, in developing the 2007-09 pension contribution rates. I have recommended the use of 50 percent of the scale in recognition that there is still some uncertainty in future trends in mortality improvement (e.g., the role of obesity and diabetes) and to ease the transition from a static to a generational mortality table.

(2) In contrast to projected mortality improvements, the underlying mortality tables with applicable age adjustments by plan represent plan-specific demographic assumptions. In developing the preliminary results reported to you on August 23, 2006, I relied upon the recommendations of the creators of the RP-2000 mortality tables in making the switch from a combined table to separate tables. I considered performing an off-cycle experience study for purposes of validating the change to separate tables, but determined there would be insufficient data to determine the appropriateness of the change given the relatively small size of the annuitant populations in the affected plans.

After discussions with the actuarial auditor, I agree that a formal and on-cycle experience study would be most prudent before recommending the use of separate mortality tables. I concur with her recommendation to defer switching from the combined mortality table to separate mortality tables for employees and annuitants until further analysis is conducted during the 2008 experience study. I will present an analysis of employee versus annuitant mortality experience in the 2008 experience study report.

Please note that recommendation (2) will result in revised rate recommendations at the September PFC meeting.

Finally, I have considered the actuarial auditor's August 23, 2006, comment that there could be "... possible benefit administration ramifications in terms of calculation of actuarial equivalence factors," associated with implementing projected mortality improvements. In my opinion, the Department of Retirement Systems is not required to use the same assumptions for benefit administration as are used in the actuarial valuation. There is a variety of alternative approaches the Department could use to approximate this assumption change while balancing the need for administrative efficiency. I would be happy to consult with the Department in this regard.

I hope you find this information useful during your deliberations. Please don't hesitate to contact me directly should you require any additional information.

Attachment:
    Table 7-3 Mortality Projection Scale AA

cc: Pension Funding Council Workgroup Members
                Liz Mendizabal, State Investment Board
                Steve Nelsen, LEOFF 2 Retirement Board
                David Pringle, Office of Program Research
                Jane Sakson, Office of Financial Management
                Eric Sund, Senate Ways and Means
                Eric Swensen, Economic and Revenue Forecast Council
                Jeff Wickman, Department of Retirement Systems
                Martin McCaulay, Office of the State Actuary
                Marilyn Oliver, Oliver Consulting

Table 7-3
Mortality Projection Scale AA

Age	Male	Female	Age	Male	Female	Age	Male	Female
1	0.020	0.020	41	0.009	0.015	81	0.009	0.007
2	0.020	0.020	42	0.010	0.015	82	0.008	0.007
3	0.020	0.020	43	0.011	0.015	83	0.008	0.007
4	0.020	0.020	44	0.012	0.015	84	0.007	0.007
5	0.020	0.020	45	0.013	0.016	85	0.007	0.006
6	0.020	0.020	46	0.014	0.017	86	0.007	0.005
7	0.020	0.020	47	0.015	0.018	87	0.006	0.004
8	0.020	0.020	48	0.016	0.018	88	0.005	0.004
9	0.020	0.020	49	0.017	0.018	89	0.005	0.003
10	0.020	0.020	50	0.018	0.017	90	0.004	0.003
11	0.020	0.020	51	0.019	0.016	91	0.004	0.003
12	0.020	0.020	52	0.020	0.014	92	0.003	0.003
13	0.020	0.020	53	0.020	0.012	93	0.003	0.002
14	0.019	0.018	54	0.020	0.010	94	0.003	0.002
15	0.019	0.016	55	0.019	0.008	95	0.002	0.002
16	0.019	0.015	56	0.018	0.006	96	0.002	0.002
17	0.019	0.014	57	0.017	0.005	97	0.002	0.001
18	0.019	0.014	58	0.016	0.005	98	0.001	0.001
19	0.019	0.015	59	0.016	0.005	99	0.001	0.001
20	0.019	0.016	60	0.016	0.005	100	0.001	0.001
21	0.018	0.017	61	0.015	0.005	101	0.000	0.000
22	0.017	0.017	62	0.015	0.005	102	0.000	0.000
23	0.015	0.016	63	0.014	0.005	103	0.000	0.000
24	0.013	0.015	64	0.014	0.005	104	0.000	0.000
25	0.010	0.014	65	0.014	0.005	105	0.000	0.000
26	0.006	0.012	66	0.013	0.005	106	0.000	0.000
27	0.005	0.012	67	0.013	0.005	107	0.000	0.000
28	0.005	0.012	68	0.014	0.005	108	0.000	0.000
29	0.005	0.012	69	0.014	0.005	109	0.000	0.000
30	0.005	0.010	70	0.015	0.005	110	0.000	0.000
31	0.005	0.008	71	0.015	0.006	111	0.000	0.000
32	0.005	0.008	72	0.015	0.006	112	0.000	0.000
33	0.005	0.009	73	0.015	0.007	113	0.000	0.000
34	0.005	0.010	74	0.015	0.007	114	0.000	0.000
35	0.005	0.011	75	0.014	0.008	115	0.000	0.000
36	0.005	0.012	76	0.014	0.008	116	0.000	0.000
37	0.005	0.013	77	0.013	0.007	117	0.000	0.000
38	0.006	0.014	78	0.012	0.007	118	0.000	0.000
39	0.007	0.015	79	0.011	0.007	119	0.000	0.000
40	0.008	0.015	80	0.010	0.007	120	0.000	0.000