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Consultants and Actuaries

January 28, 2005

Mr. Dale Orr
Actuarial Coordinator
Oregon Public Employees Retirement System

**Re: 2004 OPSRP Actuarial Equivalency Factors
Based on the 2001 Experience Study of the System**

Dear Dale:

Oregon law requires retirement allowances under certain conditions to be of equivalent actuarial value. The Retirement System uses a set of Actuarial Equivalency Factors (Factors) to convert a Normal Retirement Benefit into one of the following:

- Voluntary early retirement monthly benefit

- Elective survivorship form of monthly benefit

- Lump sum distribution

Our report dated February of 2003 provided a recommended set of actuarial equivalency factors for PERS that was adopted by the Retirement Board. The factors in this report were developed specifically for the Oregon Public Service Retirement Plan (OPSRP). The remainder of this report describes the assumptions and methods used to develop each of the factors that comprise the 2004 OPSRP Actuarial Equivalency Factors.

Early Retirement

Retirement eligibility is defined as follows:

	Normal Retirement (ORS 238A.160)	Early Retirement (ORS 238A.165)
General Service	Age 65, or Age 58 and 30 Years	Age 55
Police & Fire	Age 60, or Age 53 and 25 Years	Age 50

A member may elect a voluntary retirement earlier than the Normal Retirement Date, but will receive a reduced benefit **(ORS 238A.185)**. The reduced monthly benefit should have the same actuarial value as of the Early Retirement Date as a deferred monthly benefit payable at the Normal Retirement Date.

An Early Retirement Reduction Factor, when multiplied by the monthly pension calculated from the formula, produces a monthly benefit payable immediately which is actuarially equivalent to a deferred benefit commencing on the Normal Retirement Date.

Assumptions: At some point in the future we will be able to use OPSRP experience to determine the mortality blending by gender and class, but now we must rely on PERS experience. The experience factors were developed with a blend of mortality by gender and class of membership based on the proportion of active PERS Tier Two members expected to receive a service retirement benefit. We used a separate blend for general service and police and fire to develop the factors that apply separately to each class.

The following table documents the weighting used to develop the mortality table for the early retirement factors. The discount rate is 8% and the assumed cost-of-living adjustment is 2% per year.

Mortality Group	Mortality Table	Blending
State/Local General Service Males	RP-2000 Male (-1.5 years)	23.294%
School District Males	RP-2000 Male (-2 years)	11.418
State/Local General Service Females	RP-2000 Female (-1.5 years)	31.651
School District Females	RP-2000 Female (-3 years)	33.637
		100.000%
State/Local Police & Fire Males	RP-2000 Male (-1 year)	77.228%
State/Local Police & Females	RP-2000 Female (-1.5 years)	22.772
		100.000%

Factors: The following table illustrates the Early Retirement Reduction Factors for general service and police and fire members at integral ages. The factors are shown at monthly ages in the enclosed Table 1.

General Service			Police & Fire		
Ret. Age	Without 30 Years Table 1a	With 30 Years Table 1b	Ret. Age	Without 25 Years Table 1c	With 25 Years Table 1d
55	36.9%	75.3%	50	38.4%	75.9%
56	40.6	82.6	51	42.1	83.2
57	44.6	90.9	52	46.1	91.1
58	49.1	100.0	53	50.6	100.0
59	54.1		54	55.5	
60	59.7		55	61.1	
61	66.0		56	67.2	
62	73.0		57	74.1	
63	80.9		58	81.7	
64	89.9		59	90.3	
65	100.0		60	100.0	

Joint and Survivor Annuities

Members have the right to elect optional forms of monthly benefits that provide continuing payments over the lifetime of a named beneficiary under certain circumstances and in accordance with Internal Revenue Code provisions. The value of the expected payments under an elected option must be the actuarial equivalent of the stream of monthly payments under the single life form (ORS 238A.190). All of the following are monthly benefits payable for the life of the member, with certain additional guarantees as described, and have the equivalent value of the pension (ORS 238A.180) payable for the life of the member.

In this report we are using the PERS nomenclature of Option 1 for the life only benefit, and Options 2 and 3 for the survivor elections. Note that the OPSRP does not provide for a "pop-up" form of payment.

- **Option 2:** After the retired member's death, 100% of the monthly benefit continues to be paid for the lifetime of the beneficiary.

- **Option 3:** After the retired member's death, 50% of the monthly benefit continues to be paid for the lifetime of the beneficiary.

Assumptions: At this time, there are no retired OPSRP members, so we relied on the recent experience of PERS retirees for the assumptions. The weightings of the six groups are based on the number of retirees who retired in 1999, 2000, and 2001 who were surviving at the end of 2001. The mortality tables and weightings used to produce an average mortality rate at each age are shown below. The discount rate is 8% and the assumed cost-of-living adjustment is 2% per year.

Mortality Group	Mortality Table	Blending	
		Opt. 2	Opt. 3
State/Local General Service Males	RP-2000 Male (-1.5 years)	37%	26%
State/Local Police & Fire Males	RP-2000 Male (-1 year)	6	15
School District Males	RP-2000 Male (-2 years)	19	11
State/Local General Service Females	RP-2000 Female (-1.5 years)	18	25
State/Local Police & Females	RP-2000 Female (-1.5 years)	1	1
School District Females	RP-2000 Female (-3 years)	19	22
Total		100%	100%
Male Beneficiaries	RP-2000 Male (-1.5 years)	38%	48%
Female Beneficiaries	RP-2000 Female (-1.5 years)	62	52%
Total Beneficiaries		100%	100%

Factors: The Option 2 and Option 3 Factors for OPSRP are the same as the 2001 Factors for PERS. The Factor is multiplied by the Normal or Early Retirement Benefit payable as a life only benefit. The factors are illustrated at selected ages below and shown in their entirety in the enclosed Table 2.

Member Age Difference	Proportion of Option 1 Monthly Allowance at Selected Retirement Ages		
	55	60	65
Option 2 - 100% Continuance			
+10	86.4%	82.6%	78.3%
+5	88.5	85.4	81.9
Same Age	90.8	88.4	85.7
-5	93.0	91.3	89.4
-10	94.9	93.8	92.7
Option 3 - 50% Continuance			
+10	92.9%	90.8%	88.2%
+5	94.1	92.4	90.4
Same Age	95.3	94.1	92.6
-5	96.5	95.6	94.7
-10	97.5	97.0	96.4

Lump Sum Distributions

Members or beneficiaries may receive a lump sum distribution from the OPSRP under the following conditions:

- A vested inactive member may withdraw from the program if the actuarial equivalent of the member's benefit at the time of withdrawal is $5,000 or less (ORS 238A.120)

- If the monthly pension benefit payable to a member as of the Normal Retirement Date is less than $200, or the monthly benefit payable to the beneficiary of a deceased member is less than $200, the benefit is distributed as a lump sum amount on an actuarial equivalent basis (ORS 238A.195).

We have prepared factors to be used prior to the Early Retirement Date and a different set of factors for members who are at or beyond the Early Retirement Date. Separate sets are produced for general service and police and fire members, so there are four tables related to lump sum distributions.

Assumptions - Members: The experience factors at or after the Early Retirement Age were developed with a blend of mortality by gender and class of membership based on the proportion of active PERS Tier Two members expected to receive a service retirement benefit. The experience factors for the period prior to the Early Retirement Age were based on the proportion of active PERS Tier Two members expected to receive a withdrawal benefit. We used a separate blend for general service and police and fire to develop the factors that apply separately to each class.

The following table documents the weighting used to develop the mortality table for the lump sum distribution factors. The discount rate is 8% and there is no cost-of-living adjustment assumed.

Mortality Group	Mortality Table	Blending	
		At Ret.	Prior
State/Local General Service Males	RP-2000 Male (-1.5 years)	23.294%	21.887%
School District Males	RP-2000 Male (-2 years)	11.418	9.068
State/Local General Service Females	RP-2000 Female (-1.5 years)	31.651	41.489
School District Females	RP-2000 Female (-3 years)	33.637	27.556
		100.000%	100.000%
State/Local Police & Fire Males	RP-2000 Male (-1 year)	77.228%	79.819%
State/Local Police & Females	RP-2000 Female (-1.5 years)	22.772	20.181
		100.000%	100.000%

Factors - Members: The following table illustrates the Lump Sum Distribution Factors for general service and police and fire members at selected integral ages. The factors are shown at monthly ages in the enclosed Table 3.

	General Service		Police & Fire	
	Cash Out Age	Per $1 Monthly Benefit	Cash Out Age	Per $1 Monthly Benefit
Prior to ERD	Table 3(a)		Table 3(b)	
	35	$ 10.71	30	$ 11.47
	40	15.78	35	16.90
	45	23.28	40	24.92
	50	34.42	45	36.82
	55	51.06	50	54.51
	60	76.20	55	81.03
At or After NRD	Table 3(c)		Table 3(d)	
	65	115.26	60	121.43
	70	103.56	65	110.54
	75	90.25	70	97.99

Beneficiaries: Under certain conditions, beneficiaries may receive a lump sum distribution that is actuarially equivalent to the death benefit provided in ORS 238A.230. The monthly benefit must first be determined as of the age of the beneficiary using factors described in the next section. Once this is completed, the monthly benefit is

Assumptions - Beneficiaries: The experience factors at the beneficiary's age of distribution were developed with a blend of mortality by gender and class of membership based on the proportion of active PERS Tier Two members expected to die prior to retirement. We assumed general service mortality for all beneficiaries which is consistent with our valuation assumptions.

The following table documents the weighting used to develop the mortality table for the lump sum distribution factors. The discount rate is 8% and there is no cost-of-living adjustment assumed.

Mortality Group	Mortality Table	Blending	
		Member	Benef.
State/Local General Service Males	RP-2000 Male (-1.5 years)	47.765%	52.235%
State/Local General Service Females	RP-2000 Female (-1.5 years)	52.235	47.765
		100.000%	100.000%

Factors - Beneficiaries: The following table illustrates the Lump Sum Distribution Factors for beneficiaries at selected integral ages. The factors are shown at monthly ages in the enclosed Table 3(e).

Beneficiaries	
Cash Out Age	Per $1 Monthly Benefit
30	$ 150.78
35	148.92
40	146.41
45	142.97
50	138.27
55	131.87
60	123.45
65	113.03
70	100.93
75	87.24
80	72.50

Note that the lump sum factors for beneficiaries are multiplied by the reduced benefit at the current age of the beneficiary (see later section of this letter) while the lump sum factors for members are multiplied by the Normal Retirement Benefit.

Death Benefits

If a vested member dies prior to retirement, a benefit is payable to the member's spouse. The benefit is a life annuity actuarially equivalent to 50% of the benefit that would have been paid to the deceased member as follows.

- If the deceased member was eligible for retirement, the spouse benefit is calculated as of the date of the member's death, **(ORS 238A.230(2)(b)(A))** or

- If the deceased member was not eligible for retirement, the spouse benefit is calculated as if the deceased member terminated employment on the date of death and retired as of the early retirement date. **(ORS 238A.230(2)(b)(B))**

Two separate tables of factors are needed. The first table converts the monthly benefit that would have been paid to the member to a monthly benefit for the spouse at the age at which the member would have received the benefit. The second table converts the spouse benefit to a different commencement age.

Assumptions – Table 4(a): This table converts the monthly benefit that would have been paid to the member to a monthly benefit for the spouse. Since the spouse should receive 50% of the value the member would have received, one calculation converts the member's benefit to a lump sum value and then converts the lump sum value to the spouse's monthly benefit. The experience factors are based on the members expected to die prior to retirement for the member lump sum conversion. Spouses were assumed to exhibit the mortality of State/Local general service members of the opposite gender of the member.

The following table documents the weighting used to develop the mortality table for the conversion factors. The discount rate is 8% and the assumed cost-of-living adjustment is 2% per year.

Mortality Group	Mortality Table	Blending	
		Member	Spouse
State/Local General Service Males	RP-2000 Male (-1.5 years)	33.650%	52.235%
School District Males	RP-2000 Male (-2 years)	9.609	
State/Local General Service Females	RP-2000 Female (-1.5 years)	30.695	47.765
School District Females	RP-2000 Female (-3 years)	20.621	
State/Local Police & Fire Males	RP-2000 Male (-1 year)	4.506	
State/Local Police & Females	RP-2000 Female (-1.5 years)	0.919	
		100.000%	100.000%

Factors Table 4(a): This table converts the member's benefit (after multiplying by 50%) to a spouse's benefit commencing at the age at which the member would have received the benefit. This is the age the spouse would have been at the later of the early retirement age or the age at death of the member.

The following table illustrates the conversion factors shown in the enclosed Table 4(a).

Spouse Age *	Age of Member at Later of Date of Death or Early Retirement Age				
	50	55	60	65	70
45	0.958	0.900	0.829	0.746	0.655
50	1.004	0.944	0.870	0.783	0.686
55	1.070	1.006	0.927	0.834	0.731
60	1.164	1.094	1.008	0.907	0.795
65	1.296	1.218	1.122	1.010	0.886

* at later of member's death or early retirement age

Assumptions – Table 4(b): This table converts the monthly benefit that would have been paid to the spouse at the later of the member's date of death or the date the member would have reached early retirement. The spouse may elect to receive this benefit earlier, but it must be the equivalent. Therefore, to receive a benefit earlier, the spouse benefit calculated using Table 4(a) is reduced. The experience factors for Table 4(b) are based on the same mortality as used in Table 4(a) for the spouse. The discount rate is 8% and the assumed cost-of-living adjustment is 2% per year only after benefits commence.

Factors Table 4(b): This table converts the spouse's benefit from the age the spouse would have been at the later of the early retirement age or the age at death of the member to a different spouse age..

The following table illustrates the conversion factors shown in the enclosed Table 4(b).

Spouse Age *	Spouse's Age at Later of Member's Death or Early Retirement Age				
	50	55	60	65	70
45	0.644	0.407	0.251	0.148	0.083
50	**1.000**	0.632	0.389	0.230	0.129
55	1.582	**1.000**	0.615	0.364	0.204
60	2.572	1.626	**1.000**	0.592	0.331
65	4.348	2.748	1.690	**1.000**	0.560
70	7.760	4.905	3.017	1.785	**1.000**

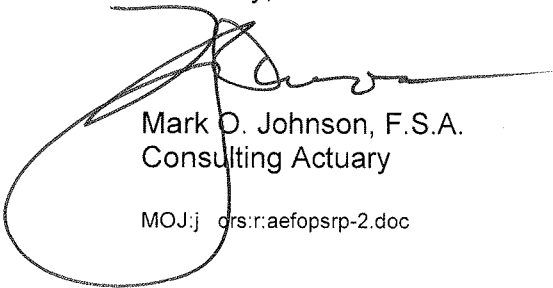* at date of benefit commencement

If you have any questions, or need any additional information, please let me know.

Sincerely,

Mark O. Johnson, F.S.A.
Consulting Actuary

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Oregon Public Employees Retirement System
2004 OPSRP Actuarial Equivalency Factors

Effective January 1, 2004

List of Tables

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