# WISCONSIN RETIREMENT SYSTEM 24TH ANNUAL ACTUARIAL VALUATION OF RETIRED LIVES DECEMBER 31, 2006

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February 26, 2007

**Employee Trust Funds Board** Madison, Wisconsin

Ladies and Gentlemen:

The results of the 24th annual actuarial valuation of core and variable annuities being paid from the Wisconsin Retirement System are presented in this report. The valuation was based upon data, furnished by the WRS staff, concerning Fund assets and individual annuitants and beneficiaries.

The date of this valuation was **December 31, 2006**. Actuarial assumptions used in the valuation are summarized in the Appendix.

The results of the valuation may be briefly summarized as follows (\$ millions).

	Core	Variable
Number of Annuitants	137,117	32,683
Annual Amount	\$ 2,843.6	\$ 391.8
Fund Balance	31,180.5	4,594.2
Actuarial Reserve	30,273.9	4,145.2
Ratio	1.03	1.108

Based upon these results, core annuities were increased by 3.0% effective April, 2007 and variable annuities were increased by 10%.

The cooperation of the Secretary and his staff in gathering materials for this valuation is acknowledged with appreciation.

Respectfully submitted,

Brie BMmp Brian B. Murphy, FS

BBM/NLJ/MB:dm

Norman Z. Jones, FSA

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Mark Buis, FSA

# **SECTION A OPERATION OF THE SYSTEM**

Each year, as of December 31, an actuarial valuation of the liability for retired persons receiving benefits from the Wisconsin Retirement System is conducted. The purpose of the valuation is to determine the actuarial present value of future benefit payments on behalf of current retired lives. This present value is the "actuarial reserve". Theoretically, if an amount of money equal to the actuarial present value were invested at a yield equal to the valuation interest rate, the initial amount plus the continuing investment income would provide exactly the right amount of money to pay the annuities of all current retired persons and their beneficiaries for the rest of their lives. The fund would decrease each year, and would become zero many decades in the future when the last annuitant dies.

The above is a "closed group" description of the operation of the annuity reserve fund. But the fund is really an "open group". The size of the fund does not actually decrease because each year more benefits are added to the rolls than are removed, and fresh money is transferred into the annuity reserve fund to finance the benefits of the new annuitants. (The actuary calculates the reserve transfers for new annuitants each year as a by-product of the actuarial valuation.)

According to theory, the fund will eventually reach a state when the number of people entering (retiring) each year is approximately equal to the number of people exiting (dying) each year. When this mature state is reached, the amount of money in the fund will remain approximately level in constant dollars from year to year. Each year the reserve transfers for the new annuitants plus investment earnings on the whole fund (total money in) will be approximately equal to the benefit payments (total money out). The only source of growth in assets would be the result of the effects of inflation. The dollars in the fund would increase, but the "real" value of the fund would not change.

There are at least two factors that cause the actual operation to be different from the theoretical operation described above. The first is that annuitants may have longer or shorter lifetimes than expected. In recognition of this, the actuary monitors mortality experience of the retirement system and recommends a new mortality table when appropriate. The second factor is that actual investment earnings are rarely equal to the assumed rate. When investment earnings differ from the assumed rate, the difference, positive or negative, is recorded in a supplemental reserve.

The Wisconsin Retirement System maintains separate reserves for core and variable annuities. Each year, the actuary determines the actuarial reserve for core and variable annuities separately. WRS' practice with respect to the use of supplemental reserves is described below.

*Core Annuity Division:* If the supplemental reserve is positive and is at least 0.5% of core annuity liabilities, core annuity increases (dividends) may be granted. If the supplemental reserve is negative and is equal to or greater than 0.5% of core annuity liabilities in absolute value, prior core annuity dividends are reduced by an aggregate amount equal to the shortfall. Increases or decreases become effective in April following the December 31 valuation.

*Variable Annuity Division:* If the supplemental reserve is at least 2% of variable annuity liabilities, substantially all of the reserve (dropping fractions of a percent) is used to increase or decrease variable annuities for the ensuing year. Increases or decreases become effective in April following the December 31 valuation.

# **SECTION B CORE ANNUITIES**

# CORE ANNUITY DIVISION DEVELOPMENT OF ASSETS AND LIABILITIES

	\$ Mi		
	Assets	Liabilities	Ratio
Ending Balance December 31, 2005	\$28,575.2	\$28,359.7	1.008
Closing Adjustments	(6.0)	0.0	
Variable Terminations	67.7	67.7	
2006 Dividend: 0.8%	0.0	211.0	
Beginning Balance January 1, 2006	28,636.9	28,638.4	1.000
Increases			
Reserve Transfers	2,685.8	2,685.8	
Regular Interest	1,428.9	1,428.9	
Additional Earnings	1,240.4	0.0	
Addition to Contingency/Data Reserve	0.0	158.2	
Experience Study	0.0	161.1	
Other	0.0	13.0	
Total Increases	5,355.1	4,447.0	
Decreases			
Annuities & Lump Sums	2,808.5	2,808.5	
Credit Re-establishments	3.0	3.0	
Releases from Contingency/Data Reserve	0.0	0.0	
Experience Study	0.0	0.0	
Other	0.0	0.0	
Total Decreases	2,811.5	2,811.5	
Ending Balance December 31, 2006	\$31,180.5	\$30,273.9	1.030

The ending liability balance includes data and contingency reserves of \$210.7 million.

Amounts to be transferred from the Employer Reserve and the Employee Reserve to the Annuity Reserve to cover liabilities for new annuities are computed as the first step in the annual actuarial valuation. The actuarial present value at time of retirement of core annuities reported as new since the last actuarial valuation is \$2,547,050,263. Adjustments to prior transfers, relating to estimated annuities for which final computations have now been made, totaled \$138,767,135. Reserve transfers are distributed as follows:

Group	Regular Transfer	Adjustment to Prior Transfer	Total Transfer
General	\$2,290,743,243	\$122,267,674	\$2,413,010,917
Protective with Social Security	175,956,765	11,892,755	187,849,520
Protective without Social Security	62,174,261	3,645,946	65,820,207
Executive & Elected	18,175,994	960,760	19,136,754
Totals	\$2,547,050,263	\$138,767,135	\$2,685,817,398

Accordingly, we recommend that \$2,685,817,398 be transferred to the Core Annuity Reserve. The results in this report assume that this transfer has been made.

The Core Annuity Fund Balance, \$31,180.6 million, exceeded the actuarial present value of core annuities and reserves, \$30,273.9 million, by \$906.6 million or 3.0% of the actuarial present value (APV) of core annuity payments. The primary sources of the 3.0% are:

-	% of APV
1. Published earnings rate	9.80%
2. Adjustment to relate earnings to average fixed annuity balance	(0.46)%
3. Earnings rate based on average balance	9.34%
<ul><li>4. Expected dividend before adjustments: 1.0934/1.05-1</li></ul>	4.13%
5. Adjustment to relate average asset to ending liability	(0.03)%
6. Carryover from last year due to timing of dividend accounting adjustments and rounding	0.00%
7. Adjustments to contingency reserve and data reserve	(0.52)%
8. Experience Study	(0.53)%
9. Experience and other effects	(0.06)%
10. Statutory adjustment to round to nearest one-tenth percent	0.01%
11. Computed dividend rate: (4) + (5) + (6) + (7) + (8) + (9) + (10)	3.0%

In accordance with the Administrative Code, ETF 20.25 and Section 40.27(2) Wisconsin Statutes (see page 27), the 3.0% was allocated to a dividend effective April, 2007.

### TRANSFERS TO ANNUITY RESERVE TO FINANCE CORE ANNUITIES APPROVED IN 2006 TABULATED BY TYPE OF ANNUITY AND OPTION

Code	Type of Benefit	Number	Annual Amount	Transfer
	<b>REGULAR RETIREMENT</b>			
1	Straight Life	1,056	\$ 19,217,693	\$ 260,009,320
2	5-Year Certain & Life	830	15,080,855	207,573,491
4	15-Year Certain & Life	1,592	27,267,283	393,116,149
7	Joint and 75%	851	19,558,759	297,874,838
9	Joint and 75% on First Death	440	10,850,158	157,266,835
11	Joint and 100%	700	13,016,824	201,753,392
12	Joint and 100% & 15-Year Certain	2,372	48,310,117	766,064,832
13	Temporary to Age 62	0	47,290,233	191,843,651
21	Certain Only	1	401,896	2,687,810
40	Mandatory & 15-Year Certain	16	177,950	2,150,264
41	Mandatory & Certain for Life Expectancy	1	3,169	30,522
42	Voluntary & Certain for Life Expectancy	0	0	0
	Total Regular	7,859	201,174,937	2,480,371,104
	Average Age at Retirement	59.5 Years		
	DISABILITY RETIREMENT			
1	Straight Life	0	0	0
2	5-Year Certain & Life	0	545	6,476
4	15-Year Certain & Life	0	0	0
7	Joint and 75%	0	0	0
9	Joint and 75% on First Death	0	0	0
1	Joint and 100%	0	0	0
2	Joint and 100% & 15-Year Certain	54	1,443,257	23,622,186
17	5-Years Certain & Life or Survivor	18	469,320	6,104,023
21	Certain Only	0	0	0
24	Straight Life	22	592,360	7,723,699
25	15-Year Certain & Life	34	712,590	9,712,828
26	Joint & 75 %	11	281,180	4,405,346
27	Joint & 100%	18	401,848	6,379,514
28	Joint & 75% on First Death	6	151,612	1,800,226
	– Total Disability	163	4,052,712	59,754,298
	Average Age at Retirement	54.2 Years		
	DEATH-IN-SERVICE BENEFITS			
1	Straight Life	4	26,050	379,315
2	5-Year Certain & Life	3	19,939	223,322
4	15-Year Certain & Life	34	342,288	5,357,858
3	Temporary to Age 62	0	115,432	711,647
21	Certain Only	2	48,505	252,719
42	Voluntary & Certain for Life Expectancy	0	0	0
	Total Death-in-Service	43	552,214	6,924,861
	Average Age at Retirement	53.1 Years		
	GRAND TOTAL	8,065	\$205,779,863	\$2,547,050,263

Many annuities in this category were additional annuities. The number counts are included elsewhere.

# CORE ANNUITIES BEING PAID DECEMBER 31, 2006 TABULATED BY TYPE OF ANNUITY AND OPTION

Code	Type of Benefit	Number	Annual Amount	Present Value
	REGULAR RETIREMENT			
1	Straight Life	17,235	\$ 292,776,683	\$ 2,985,582,854
2	5-Year Certain & Life	18,266	304,094,851	2,929,222,420
3	10-Year Certain & Life	518	7,692,420	31,486,460
4	15-Year Certain & Life	29,384	495,729,138	5,004,207,124
5	Joint and 50%	163	2,862,698	13,429,989
6	Joint and 50% and 15-Year Certain	25	202,575	944,051
7	Joint and 75%	15,996	356,691,133	4,302,907,148
8	Joint and 75% Integrated	129	2,530,644	18,103,256
9	Joint and 75% on First Death	12,367	324,886,573	3,463,505,624
10	Joint and 75% & 10-Year Certain	25	341,141	1,216,293
11	Joint and 100%	10,791	204,385,084	2,478,116,203
12	Joint and 100% & 15-Year Certain	23,180	471,413,842	6,526,358,250
13	Temporary to Age 62	1	215,741,897	582,262,876
14	5-Year Certain & Life Integrated	359	2,409,673	11,675,438
15	15-Year Certain & Life Integrated	241	5,008,021	25,794,339
20	Cash Refund Annuity	0	0	0
21	Certain Only	8	3,707,926	16,828,059
22	Joint and \$600	0	0	0
25	15-Year Certain & Life & Survivor	0	0	0
40	Mandatory and Certain for 15 Years	117	774,956	8,108,964
41	Mandatory & Certain for Life Expectancy	15	228,334	1,444,078
42	Voluntary & Certain for Life Expectancy	123	1,791,455	11,703,407
99	Joint and 66-2/3% Original Amount	346	2,580,668	14,150,968
99	Joint and 66-2/3% Dividends	0	7,743,827	41,320,530
	Total Regular	129,289	\$2,703,593,539	\$28,468,368,331

Many annuities in this category were additional annuities. The number counts are included elsewhere.

# CORE ANNUITIES BEING PAID DECEMBER 31, 2006 TABULATED BY TYPE OF ANNUITY AND OPTION

Code	Type of Benefit	Number	Annual Amount	Present Value
	DISABILITY RETIREMENT			
1	Straight Life	6	\$ 29,508	\$ 204,630
2	5-Year Certain & Life	0	6,383	58,138
3	10-Year Certain & Life	0	0	0
4	15-Year Certain & Life	0	9,133	89,462
7	Joint and 75%	0	3,483	40,439
9	Joint and 100%	0	0	0
11	Joint and 100%	0	10,509	66,167
12	Joint and 100% & 15-Year Certain	1,579	30,035,073	423,146,065
17	5-Year Certain & Life or Survivor	729	15,217,567	132,389,240
18	Cash Refund Annuity	135	1,990,152	9,475,031
21	Certain Only	0	10,365	35,956
23	Joint and \$600	4	3,505	14,955
24	Straight Life	647	14,936,647	159,327,680
25	15-Year Certain & Life or Survivor	1,273	26,455,981	285,469,763
26	Straight Life & Joint & 75%	526	10,500,386	122,794,812
27	Straight Life & Joint & 100%	1,303	22,861,714	284,793,751
28	Joint & 75% on First Death	258	5,088,881	46,484,943
20 99	Joint & 66-2/3% Original Amount	45	170,997	969,759
99	Joint & 66-2/3% Dividends	0	601,102	3,399,510
	Total Disability	6,505	127,931,386	1,468,760,301
	DEATH-IN-SERVICE BENEFITS			
1	Straight Life	281	2,415,684	24,932,251
2	5-Year Certain & Life	129	1,569,969	16,414,377
4	15-Year Certain & Life	733	6,472,534	77,029,939
7	Joint and 75%	1	41,118	234,348
12	Joint and 100% & 15-Year Certain	3	11,083	170,091
12	Temporary to Age 62	0	1,003,139	3,992,036
13	5-Year Certain & Life Integrated	142	154,112	777,304
14	15-Year Certain & Life Integrated	2	48,486	292,343
17	5-Year Certain & Life or Survivor	1	3,281	18,279
21	Certain Only	5	70,005	317,193
22	Joint and \$600	0	10,005	517,195
23	Joint and \$600	0	0	(
42	Voluntary & Certain for Life Expectancy	23	231,455	1,227,909
42 99	Joint & 66-2/3% Original Amount	25	251,433	1,227,909
99 99	Joint & 66-2/3% Original Amount Joint & 66-2/3% Dividends	5 0	65,131	482,344
	Total Death-in-Service	1,323	\$ 12,111,056	\$ 126,077,090
	GRAND TOTAL	137,117	\$2,843,635,981	\$30,063,205,722

Many annuities in this category were additional annuities. The number counts are included elsewhere.

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### CORE ANNUITIES BEING PAID DECEMBER 31, 2006 TABULATED BY ATTAINED AGES

	Regular		gular Disability		Disability Death-in-Service			Totals
Attained		Annual		Annual		Annual		Annual
Ages	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Under 20	0	\$ 0	5	\$ 18,631	8	\$ 47,785	13	\$ 66,416
20-24	0	0	8	46,348	7	57,331	15	103,679
25-29	0	0	7	49,044	14	87,926	21	136,970
30-34	0	0	20	174,247	11	46,409	31	220,656
35-39	5	32,341	32	420,773	15	87,544	52	540,658
40-44	19	177,298	120	2,218,385	21	156,744	160	2,552,427
45-49	98	1,043,041	265	4,878,660	49	390,743	412	6,312,444
50-54	1,067	27,240,224	701	14,835,644	56	622,426	1,824	42,698,294
55-59	16,060	441,670,424	1,159	25,152,509	135	1,897,323	17,354	468,720,256
60-64	24,782	565,480,643	1,111	23,498,178	162	2,044,499	26,055	591,023,320
65-69	23,984	467,036,139	996	19,990,236	151	1,487,714	25,131	488,514,089
70-74	20,534	411,536,198	799	16,215,965	147	1,280,324	21,480	429,032,487
75-79	17,281	350,189,110	663	11,101,853	155	1,442,344	18,099	362,733,307
80-84	12,607	244,901,575	395	6,454,222	144	1,066,374	13,146	252,422,171
85-89	7,644	125,606,678	161	2,244,048	117	670,832	7,922	128,521,558
90-94	3,231	42,336,840	53	560,789	69	271,101	3,353	43,168,730
95& Up	925	9,242,844	10	61,512	28	159,528	963	9,463,884
Certain Only*	1,052	17,100,184	0	10,342	34	294,109	1,086	17,404,635
Totals	129,289	\$2,703,593,539	6,505	\$127,931,386	1,323	\$12,111,056	137,117	\$2,843,635,981
Averages in Year	rs							
Age at retirem		60.0		52.1		50.4		59.7
Attained age		70.5		64.6		69.7		70.3
Service at reti	rement	23.1		18.1		20.9		22.9

\* Certain Only category consists of continuations of 5, 10 and 15-year certain and life annuities to beneficiaries of deceased annuitants and all option 21 annuities.

**Annual \$ Millions** 



**Attained Age Groups** 





\* Includes regular and disability retirees and survivor beneficiaries. The "certain" category includes annuities paid for a fixed period which is not dependent upon the age of the recipient.

### PROJECTED FUTURE CORE ANNUITY PAYMENTS ON BEHALF OF PRESENT RETIRED LIVES INCLUDING FUTURE DIVIDENDS



Total Future Payments	\$73.4	billion
From Present Assets	31.2	
From Investment Return	42.2	

# **SECTION C** VARIABLE ANNUITIES

# VARIABLE ANNUITY DIVISION DEVELOPMENT OF ASSETS AND LIABILITIES

	\$ Mi		
	Assets	Liabilities	Ratio
Ending Balance December 31, 2005	\$4,092.8	\$3,970.7	1.031
Closing Adjustments	(0.5)	0.0	
Variable Terminations	(67.7)	(67.7)	
2006 Adjustment: 3%	0.0	119.7	
Beginning Balance January 1, 2006	4,024.6	4,022.7	1.000
Increases			
Reserve Transfers	257.9	257.9	
Regular Interest	197.9	197.9	
Additional Earnings	502.9	0.0	
Addition to Contingency/Data Reserve	0.0	20.6	
Experience Study	0.0	20.1	
Other	0.0	15.1	
Total Increases	958.7	511.6	
Decreases			
Annuities & Lump Sums	388.1	388.1	
Credit Re-establishments	1.0	1.0	
Release from Contingency/Data Reserve	0.0	0.0	
Experience Study	0.0	0.0	
Other	0.0	0.0	
Total Decreases	389.1	389.1	
Ending Balance December 31, 2006	\$4,594.2	\$4,145.2	1.108

The ending liability balance includes contingency reserves of \$20.6 million.

Amounts to be transferred from the Employer Reserve and the Employee Reserve to the Annuity Reserve to cover liabilities for new annuities are computed as the first step in the annual actuarial valuation. The actuarial present value at time of retirement of variable annuities reported as new since the last actuarial valuation is \$258,006,495. Adjustments to prior transfers, relating to estimated annuities for which final computations have now been made, totaled \$(146,445). Reserve transfers were distributed as follows:

Group	Regular Transfer	Adjustment to Prior Transfer	Total Transfer
General	\$245,853,403	\$(258,425)	\$245,594,978
Protective with Social Security	8,677,118	124,031	8,801,149
Protective without Social Security	1,729,798	(423,657)	1,306,141
Executive & Elected	1,746,176	411,606	2,157,782
Totals	\$258,006,495	\$(146,445)	\$257,860,050

Accordingly, we recommend that \$257,860,050 be transferred to the Variable Annuity Reserve. The results in this report assume that this transfer has been made.

Variable Annuity Reserves, \$4,594.2 million, exceeded the actuarial present value of variable annuities, \$4,145.2 million, by \$449.0 million as of December 31, 2006 or 10% of the actuarial present value (APV) of variable annuity payments. In accordance with Section 40.28(2) of the Wisconsin statutes (see page 27), variable annuities will be increased by 10% effective April, 2007. The primary sources of the 10% are as follows:

	% of APV
1. Published earnings rate based on beginning of year balances	18.0%
2. Adjustment to relate earnings to average variable annuity fund balance	(0.3)%
3. Earnings rate based on average balance	17.7%
<ul><li>4. Expected change before adjustments: 1.177/1.05-1</li></ul>	12.1%
5. Adjustment to relate average asset to ending liability	0.0%
6. Carryover from last year due to timing of distribution, accounting adjustments and truncation	0.0%
7. Adjustments to contingency reserve	(0.5)%
8. Experience Study	(0.5)%
9. Experience and other effects	(0.3)%
10. Statutory adjustment to truncate to whole percent	(0.8)%
11. Variable annuity change: (4)+(5)+(6)+(7)+(8)+(9)+(10)	10.0%

#### TRANSFERS TO ANNUITY RESERVE TO FINANCE VARIABLE ANNUITIES APPROVED IN 2006 TABULATED BY TYPE OF ANNUITY AND OPTION

Code	Type of Benefit	Number	Annual Amount	Transfer
	<b>REGULAR RETIREMENT</b>			
1	Straight Life	251	\$ 1,957,738	\$ 26,204,871
2	5-Year Certain & Life	192	1,477,073	19,934,580
4	15-Year Certain & Life	370	2,454,069	35,374,051
7	Joint and 75%	253	2,249,571	34,043,525
9	Joint and 75% on First Death	149	1,760,361	25,253,216
11	Joint and 100%	166	1,004,229	15,493,808
12	Joint and 100% & 15-Year Certain	635	5,264,723	82,826,464
13	Temporary to Age 62	0	3,764,664	14,920,471
21	Certain Only	1	109,190	957,809
40	Mandatory & Certain for Life Expectancy	1	23,212	271,892
41	Mandatory & Certain for Life Expectancy	1	3,201	30,831
42	Voluntary & Certain for Life Expectancy	0	0	0
	Total Regular	2,019	20,068,031	255,311,518
	Average Age at Retirement	58.8 Years		
	DISABILITY RETIREMENT			
11	Joint and 100%	0	0	0
12	Joint and 100% & 15-Year Certain	20	44,428	708,048
17	5-Year Certain & Life or Survivor	4	28,639	394,699
21	Certain Only	0	0	0
24	Straight Life	6	7,200	91,252
25	15-Year Certain & Life	9	50,293	679,326
26	Joint & 75 %	5	16,593	265,087
27	Joint & 100%	2	1,920	28,623
28	Joint & 75% on First Death	2	16,824	167,793
	Total Disability	48	165,897	2,334,828
	Average Age at Retirement	53.5 Years		
	DEATH-IN-SERVICE BENEFITS			
1	Straight Life	2	8,500	137,995
2	5-Year Certain & Life	1	3,858	49,675
4	15-Year Certain & Life	10	10,013	164,251
13	Temporary to Age 62	0	260	2,789
21	Certain Only	1	693	5,439
42	Voluntary & Certain for Life Expectancy	0	0	0
	Total Death-in-Service	14	23,324	360,149
	Average Age at Retirement	52.1 Years		
	GRAND TOTAL	2,081	\$20,257,252	\$258,006,495

Many annuities in this category were additional annuities. The number counts are included elsewhere.

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# VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2006 TABULATED BY TYPE OF ANNUITY AND OPTION

Code	Type of Benefit	Number	Annual Amount	Present Value
	U L			
	<b>REGULAR RETIREMENT</b>			
1	Straight Life	3,672	\$ 39,516,542	\$ 382,808,302
2	5-Year Certain & Life	3,779	36,346,753	339,538,657
3	10-Year Certain & Life	136	1,036,957	4,063,936
4	15-Year Certain & Life	6,350	62,553,154	629,548,067
5	Joint and 50%	91	813,899	3,713,286
6	Joint and 50% and 15-Year Certain	21	139,702	681,171
7	Joint and 75%	4,187	51,609,331	614,335,885
8	Joint and 75% Integrated	41	261,253	1,905,608
9	Joint and 75% on First Death	3,961	61,835,571	646,219,666
10	Joint and 75% & 10-Year Certain	15	129,006	465,710
11	Joint and 100%	2,666	30,299,207	350,196,251
12	Joint and 100% & 15-Year Certain	5,971	72,460,931	981,217,899
13	Temporary to Age 62	0	22,957,567	57,106,516
14	5-Year Certain & Life Integrated	111	339,797	1,606,412
15	15-Year Certain & Life Integrated	58	333,421	1,662,516
21	Certain Only	5	1,093,189	5,194,336
25	15-Year Certain & Life or Survivor	0	0	0
40	Mandatory & Certain for 15 years	15	149,988	1,515,220
41	Mandatory & Certain for Life Expectancy	3	19,222	128,538
42	Voluntary & Certain for Life Expectancy	14	261,379	1,502,787
	Total Regular	31,096	\$382,156,869	\$4,023,410,763

Many annuities in this category were additional annuities. The number counts are included elsewhere.

# VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2006 TABULATED BY TYPE OF ANNUITY AND OPTION

le	Type of Benefit	Number	Annual Amount	Present Value		
	DISABILITY RETIREMENT					
	Straight Life	2	\$ 3,129	\$ 20,24		
	5-Year Certain & Life	0	0	. ,		
	15-Year Certain & Life	0	0			
	Joint and 75%	0	107	1,38		
	Joint and 100%	0	11,195	70,48		
	Joint and 100% & 15-Year Certain	299	1,984,057	26,176,24		
	5-Year Certain & Life or Survivor	145	814,344	6,445,36		
	Cash Refund Annuity	32	101,658	313,86		
	Certain Only	0	0	,		
	Straight Life	111	665,235	6,072,97		
	15-Year Certain & Life or Survivor	218	1,315,019	13,474,80		
	Straight Life & Joint & 75%	116	869,076	9,451,15		
	Straight Life & Joint & 100%	244	1,469,061	17,103,16		
	Joint & 75% on First Death	65	452,225	3,861,70		
	Total Disability	1,232	\$ 7,685,106	\$ 82,991,39		
	DEATH-IN-SERVICE BENEFITS					
	Straight Life	57	\$ 363,465	\$ 3,340,33		
	5-Year Certain & Life	36	287,976	2,778,56		
	15-Year Certain & Life	218	1,133,134	11,302,01		
	Temporary to Age 62	0	97,301	355,39		
	5-Year Certain & Life Integrated	35	34,582	177,46		
	Certain Only	3	11,271	71,28		
	Voluntary & Certain for Life Expectancy	6	28,905	158,99		
	Total Death-in-Service	355	\$ 1,956,634	\$ 18,184,04		
	GRAND TOTAL	32,683	\$391,798,609	\$4,124,586,20		

Many annuities in this category were additional annuities. The number counts are included elsewhere.

# VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2006 TABULATED BY ATTAINED AGES

	Regular		Di	sability	Death	-in-Service	Totals		
Attained		Annual	Annual			Annual		Annual	
Ages	No.	Amount	No.	Amount	No.	Amount	No.	Amount	
25-29	0	\$ 0	2	\$ 3,158	2	\$ 2,828	4	\$ 5,986	
30-34	0	0	3	16,040	5	6,811	8	22,851	
35-39	2	14,408	8	43,343	4	7,945	14	65,696	
40-44	7	49,552	28	24,381	6	4,866	41	78,799	
45-49	23	102,300	39	59,804	13	24,983	75	187,087	
50-54	261	1,902,192	137	414,361	16	57,771	414	2,374,324	
55-59	4,349	49,928,023	194	1,114,771	38	190,657	4,581	51,233,451	
60-64	6,211	80,887,926	205	1,705,908	36	271,733	6,452	82,865,567	
65-69	5,030	66,524,202	178	1,499,586	37	263,959	5,245	68,287,747	
70-74	4,527	61,252,215	169	1,210,717	33	269,561	4,729	62,732,493	
75-79	4,210	53,721,993	135	876,179	36	169,668	4,381	54,767,840	
80-84	3,196	36,568,097	79	459,400	48	233,557	3,323	37,261,054	
85-89	1,978	19,593,965	41	222,355	36	246,376	2,055	20,062,696	
90-94	863	7,082,342	11	28,383	21	91,778	895	7,202,503	
95& Up	214	1,658,232	0	0	3	10,537	217	1,668,769	
Certain Only*	225	2,871,422	3	6,720	21	103,604	249	2,981,746	
Totals	31,096	\$382,156,869	1,232	\$7,685,106	355	\$1,956,634	32,683	\$391,798,609	
Averages in Yea	ars								
Age at retire		59.6		52.7		51.3		59.3	
Attained age		70.4		65.4		70.0		70.2	
Service at ret		25.3		20.9		22.5		25.1	

\* Certain only category consists of continuations of 5, 10 and 15-year certain and life annuities to beneficiaries of deceased annuitants and all option 21 annuities.

# **SECTION D COMPARATIVE STATEMENTS**

### CORE ANNUITIES COMPARATIVE STATEMENT 1983 THROUGH 2006

			\$ Millions				
Valuation	Number	Annual Annuities	Fund Balance	Actuarial	Datio	Chang Annuities	e in CPI
Date	Number	Annuities	Dalalice	Reserve	Ratio	Annuities	CPI
1983	57,770	\$ 177.7	\$ 1,830.3	\$ 1,738.3	1.053	5.0 %	3.8 %
1984	60,302	214.3	2,255.5	2,120.3	1.064	6.0 %	4.0 %
1985	62,953	257.6	2,758.2	2,561.0	1.077	7.2 %	3.8 %
1986	65,425	303.5	3,256.9	3,021.2	1.078	7.6 %	1.1 %
1987	67,688	366.9	3,833.7	3,594.6	1.067	6.7 %	4.4 %
1988	70,017	420.6	4,319.6	4,150.9	1.041	4.1 %	4.4 %
1989	73,232	488.7	5,487.4	4,928.1	1.113	11.3 %	4.6 %
1990	77,666	611.3	6,443.8	6,219.1	1.036	3.6 %	6.2 %
1991	79,465	660.4	7,137.8	6,711.3	1.063	6.3 %	3.0 %
1992	81,508	732.3	7,782.4	7,456.6	1.044	4.4 %	3.0 %
1993	83,836	801.7	8,608.2	8,205.3	1.049	4.9 %	2.7 %
1994	86,214	882.2	9,286.2	9,029.6	1.028	2.8 %	2.7 %
1995	88,998	955.8	10,351.7	9,804.1	1.056	5.6 %	2.6 %
1996	92,198	1,065.8	11,699.8	10,977.1	1.066	6.6 %	3.3 %
1997	95,128	1,188.4	13,185.1	12,240.4	1.077	7.7 %	1.7 %
1998	99,112	1,349.5	14,951.8	13,943.0	1.072	7.2 %	1.6 %
1999	102,817	1,513.8	16,857.8	15,687.2	1.075	17.1 %*	2.7 %
2000	107,425	1,867.0	20,517.8	19,405.3	1.057	5.7 %	3.4 %
2001	112,142	2,048.6	21,979.7	21,283.6	1.033	3.3 %	1.6 %
2002	116,289	2,226.6	23,142.4	23,202.9	0.997	0.0 %	2.4 %
2003	121,582	2,364.7	25,071.9	24,724.0	1.014	1.4 %	1.9 %
2004	126,211	2,500.3	26,920.0	26,232.2	1.026	2.6 %	3.3 %
2005	131,674	2,691.4	28,575.3	28,359.7	1.008	0.8 %	3.4 %
2006	137,117	2,843.6	31,180.5	30,273.9	1.030	3.0 %	2.6 %
24-Year Aver	age					5.4 %	3.1 %
10-Year Aver	age					4.8 %	2.5 %

\* Including 10.6% Act 11 transfer.

### VARIABLE ANNUITIES COMPARATIVE STATEMENT 1983 THROUGH 2006

			\$ Millions					
Valuation		Annual	Fund	Actuarial		Change in		
Date	Number	Annuities	Balance	Reserve	Ratio	Annuities	CPI	
1983	13,598	\$ 25.9	\$ 289.4	\$ 245.0	1.181	18.0 %	3.8 %	
1984	14,520	34.2	329.2	327.5	1.005	0.0 %	4.0 %	
1985	15,529	38.0	463.1	366.6	1.263	26.0 %	3.8 %	
1986	16,276	51.8	538.7	498.6	1.080	8.0 %	1.1 %	
1987	17,084	60.4	548.8	584.2	0.939	(6.0)%	4.4 %	
1988	17,779	61.4	682.6	594.0	1.149	14.0 %	4.4 %	
1989	18,502	75.9	878.1	756.5	1.161	16.0 %	4.6 %	
1990	19,922	101.0	868.6	1,013.4	0.857	(14.0)%	6.2 %	
1991	20,538	91.5	1,101.3	929.7	1.184	18.0 %	3.0 %	
1992	20,968	112.6	1,208.6	1,147.4	1.053	5.0 %	3.0 %	
1993	21,623	123.7	1,407.9	1,268.6	1.110	11.0 %	2.7 %	
1994	22,248	144.6	1,418.0	1,487.0	0.954	(4.0)%	2.7 %	
1995	22,978	150.2	1,854.2	1,556.0	1.192	19.0 %	2.6 %	
1996	23,725	189.8	2,264.9	1,976.7	1.146	14.0 %	3.3 %	
1997	24,462	228.2	2,800.0	2,371.5	1.181	18.0 %	1.7 %	
1998	25,424	289.5	3,400.5	3,035.5	1.120	12.0 %	1.6 %	
1999	26,257	345.8	4,432.9	3,659.1	1.212	21.0 %	2.7 %	
2000	27,321	445.3	4,211.4	4,749.3	0.887	(11.0)%	3.4 %	
2001	28,314	424.4	3,901.8	4,547.4	0.858	(14.0)%	1.6 %	
2002	28,662	374.0	2,899.3	3,999.1	0.726	(27.0)%	2.4 %	
2003	29,496	273.3	3,635.9	2,892.2	1.257	25.0 %	1.9 %	
2004	30,270	346.0	3,909.9	3,654.5	1.070	7.0 %	3.3 %	
2005	31,499	376.5	4,092.7	3,970.7	1.031	3.0 %	3.4 %	
2006	32,683	391.8	4,594.2	4,145.2	1.108	10.0 %	2.6 %	
4-Year Aver	age					6.1 %	3.1 %	
)-Year Aver	age					3.1 %	2.5 %	



# ANNUITIES BEING PAID BY TYPE DECEMBER 31, 2006 \$ MILLIONS



# ANNUITIES BEING PAID DECEMBER 31, 2006 TABULATED BY YEAR OF RETIREMENT (\$1,000s ANNUALLY)

Year		Fixed A	nnuities		Variable Annuities				Avg. Total
Ret'd	No.	Initial	Increases	Total	No.	Initial	Increases	Total	Annuity
2006	8,029	\$ 203,835	\$ 0	\$ 203,835	2,073	\$ 20,112	\$ 0	\$ 20,112	\$27,892
2005	8,464	207,026	888	207,914	2,089	20,505	617	21,122	27,060
2004	7,672	175,421	3,860	179,281	1,895	18,390	1,877	20,267	26,010
2003	7,806	178,060	7,487	185,547	1,760	15,458	5,837	21,295	26,498
2002	7,372	153,472	7,424	160,896	1,601	20,453	127	20,580	24,617
2001	7,498	144,478	9,703	154,181	1,729	30,074	(4,057)		24,033
2000	7,562	134,515	15,731	150,246	1,575	33,008	(7,599)		23,229
1999	6,504	95,637	28,523	124,160	1,350	22,501	(1,545)	20,956	22,312
1998	6,457	88,895	34,383	123,278	1,356	19,821	854	20,675	22,294
1997	5,517	73,422	36,059	109,481	1,182	14,531	3,370	17,901	23,089
1996	5,594	72,079	42,919	114,998	1,213	12,888	5,174	18,062	23,786
1995	5,154	63,340	43,557	106,897	1,128	9,723	6,495	16,218	23,887
1994	4,677	54,781	41,282	96,063	1,101	9,438	5,698	15,136	23,776
1993	4,448	48,141	39,784	87,925	1,068	7,474	5,818	13,292	22,756
1992	3,858	40,030	36,262	76,292	913	6,084	5,283	11,367	22,721
1991	3,499	34,262	34,626	68,888	856	4,758	5,724	10,482	22,684
1990	5,606	58,646	64,739	123,385	1,496	9,508	8,522	18,030	25,226
1989	4,394	45,076	56,810	101,886	1,072	5,887	7,064	12,951	26,135
1988	3,529	29,018	41,384	70,402	902	3,964	5,972	9,936	22,765
1987	3,204	24,191	38,636	62,827	853	3,558	4,832	8,390	22,227
1986	2,982	21,658	39,212	60,870	785	3,085	4,766	7,851	23,045
1985	2,823	21,047	42,554	63,601	735	2,174	4,794	6,968	24,997
1984	2,330	16,135	35,331	51,466	673	1,934	4,270	6,204	24,752
1983	2,111	11,065	26,163	37,228	590	1,456	4,046	5,502	20,242
1982	1,674	7,305	19,224	26,529	456	878	2,927	3,805	18,121
1981	1,527	5,649	16,047	21,696	396 251	669	2,217	2,886	16,098
1980 1979	1,216 959	3,937 3,070	11,608 9,654	15,545 12,724	351 261	478 275	2,028 1,319	2,506	14,845 14,931
1979 1978	939 852	2,503	9,634 8,033	12,724	251	273 244	1,319	1,594 1,514	14,931
1978 1977	832 784	2,303 2,107	8,033 6,901	9,008	232 246	244 258	1,270	1,514	14,145
1977	672	1,685	5,683	9,008 7,368	240 197	238 149	756	905	12,310
1970	520	1,085	4,180	7,308 5,400	157	149	645	903 749	11,825
1973	421	971	3,375	4,346	102	78	432	510	11,535
1973	325	671	2,308	2,979	90	70	351	423	10,467
1973	247	396	1,427	1,823	48	42	186	228	8,305
1972	135	198	720	918	33	23	100	130	7,764
1970	135	190	644	834	29	16	89	105	6,952
1969	97	130	463	593	20	10	48	59	6,709
1968	74	89	303	392	12	11	49	60	6,118
1967	64	68	248	316	11	3	18	21	5,267
	0.	50	2.0	510	**	5	10	21	5,207
Prior	325	223	859	1,082	25	8	48	56	3,328
Total	137,117	\$2,024,642	\$818,994	\$2,843,636	32,683	\$300,103	\$91,696	\$391,799	\$23,596

### COMPARISON OF ACTUAL TO EXPECTED DEATHS AMONG RETIRED LIVES (NORMAL RETIREMENT ONLY) DURING 2006

	Male Deaths			1	Female Deaths			<b>Total Deaths</b>		
Age	Actual	Expected	Exposure	Actual	Expected	Exposure	Actual	Expected	Exposure	
30-34						1			1	
35-39						7			7	
40-44						20			20	
45-49			19			94			113	
50-54	3	2	821			427	3	2	1,248	
55-59	33	46	7,886	25	32	8,392	58	78	16,278	
60-64	85	90	11,535	52	61	12,060	137	151	23,595	
65-69	107	143	10,974	101	98	12,514	208	241	23,488	
70-74	192	222	9,651	143	148	10,800	335	370	20,451	
75-79	273	330	7,723	256	231	9,473	529	561	17,196	
80-84	362	390	5,308	341	334	7,519	703	724	12,827	
85-89	342	326	2,641	413	430	5,235	755	756	7,876	
90-94	181	184	919	382	369	2,551	563	553	3,470	
95-99	40	41	146	188	172	754	228	213	900	
100&Up	10	6	16	54	47	130	64	53	146	
Totals	1,628	1,780	57,639	1,955	1,922	69,977	3,583	3,702	127,616	
Average										
Ages	80.1	79.3	69.4	84.0	83.7	71.4	82.2	81.6	70.5	

# SECTION E APPENDIX

The interest rate used in the valuation was 5.0% a year, compounded yearly, as provided in Section 40.02 of the Wisconsin Statutes. The mortality table used in the valuation was the Wisconsin Projected Experience Mortality Table-2005, as adopted by the Board in connection with the 2002-2005 Experience Study. In addition, retired life liabilities in the valuations contain a reserve for mortality improvement. The reserve level used in this valuation was 0.5%.

#### SINGLE LIFE RETIREMENT VALUES

Sample	Present V	Future Life			
Attained	Monthly	v for Life	Expectan	cy (years)	
Ages	Males	Females	Males	Females	
40	\$205.69	\$213.54	40.9	45.3	
45	196.14	205.53	36.2	40.5	
50	184.61	195.62	31.5	35.7	
55	171.16	183.60	27.0	30.9	
60	155.69	169.88	22.7	26.4	
65	137.31	153.66	18.5	22.0	
70	116.87	134.71	14.5	17.8	
75	95.20	113.77	11.0	13.9	
80	74.62	91.62	8.1	10.4	
85	55.95	69.69	5.7	7.4	

#### Wisconsin Projected Experience Table - 2005 with 5% Interest

The values shown above are for non-disabled participants. Sample values for disabled participants are as follows:

Sample Attained		alue of \$1 y for Life	Future Life Expectancy (years)		
Ages	Males	Females	Males	Females	
40	\$188.17	\$200.45	33.0	38.1	
45	175.49	189.75	28.5	33.4	
50	160.60	176.73	24.1	28.7	
55	144.08	161.35	20.0	24.2	
60	126.15	144.83	16.2	20.1	
65	105.47	126.05	12.5	16.1	
70	83.80	104.95	9.3	12.4	
75	62.40	83.07	6.5	9.1	
80	44.25	61.62	4.3	6.3	
85	29.47	42.01	2.8	4.1	

#### **CORE ANNUITIES - 40.27(2)**

"CORE ANNUITY RESERVE SURPLUS DISTRIBUTIONS. Surpluses in the core annuity reserve established under s. 40.04(6) and (7) shall be distributed by the board if the distribution will result in at least a 0.5% increase in the amount of annuities in force, on recommendation of the actuary, as follows:

(a) The distributions shall be expressed as percentage increases in the amount of the monthly annuity in force, including prior distributions of surpluses but not including any amount paid from funds other than the core annuity reserve fund, preceding the effective date of the distribution. For purposes of this subsection, annuities in force include any disability annuity suspended because the earnings limitation had been exceeded by that annuitant in that year.

(b) Prorated percentages based on the annuity effective date may be applied to annuities with effective dates during the calendar year preceding the effective date of the distribution, as provided by rule, but no other distinction may be made among the various types of annuities payable from the core annuity reserve.

(c) The distributions shall not be offset against any other benefit being received but shall be paid in full, nor shall any other benefit being received be reduced by the distributions. The annuity reserve surplus distributions authorized under this subsection may be revoked by the board in part or in total as to future payments upon recommendation of the actuary if a deficit occurs in the core annuity reserves."

#### VARIABLE ANNUITIES - 40.28(2)

"Whenever the balance in the variable annuity reserve, as of December 31 of any year, exceeds or is less than the then present value of all variable annuities in force, determined in accordance with the rate of interest and approved actuarial tables then in effect, by at least 2% of the present value of all variable annuities in force, the amount of each variable annuity payment shall be proportionately increased or decreased, disregarding fractional percentages, and effective on a date determined by rule, so as to reduce the variable annuities to less than one percent."

#### NARRATIVE REGARDING THE DEVELOPMENT OF DIVIDEND AND VARIABLE ANNUITY CHANGES SHOWN ON PAGES 6 AND 15

#### 1. Published Earnings Rate

The earnings rate published by DETF is funds' earnings credits expressed as a percentage of the beginning year balance adjusted for benefit payments and reserve transfers.

#### 2. Adjustment to Relate Earnings to Averaged Core Annuity Balance

Item 3 below minus Item 1 above.

#### 3. Earnings Rate Based on Average Balance

This is similar to the published earnings rate except that the rate is determined as a percentage of the average balance during the year instead of the adjusted beginning of year balance.

#### 4. Expected Dividend (Variable Change) before Adjustments

The relative difference in fund growth based on actual versus the 5% assumed earnings rates.

#### 5. Adjustment to Relate Average Asset to Ending Liability

The final dividend/variable change is calculated based on the end of year assets divided by the end of year liabilities. Since the calculations in items 3 and 4 are based on average (approximately mid-year) balances, this adjustment is needed so that the final rate will be based on the end of year liabilities.

# 6. Carryover from Last Year Due to Timing of Distribution and Accounting Adjustments (and Truncation for Variable Annuity)

The dividend or variable rate changes are made effective April 1 of each year. This adjustment takes into account the fact that the prior year dividend/variable increase was in effect for less than a full year as well as any accounting adjustments made to the asset value at the beginning of the year. This adjustment also carries over any truncated or rounded amounts from the prior year.

#### 7. Adjustments to Contingency Reserve and Data Reserve

Currently there is a reserve for incomplete data for the dividend calculation of 0.2% and a mortality improvement reserve for both the dividend and variable calculations that starts at 0.5% and grades to 1.5% over a 3-year experience period. The adjustment is equal to the amount held in reserve for the current year less the amount held in reserve for the prior year expressed as a percent of the end of year liability. This reserve is accumulated to reflect the fact that over time, mortality rates tend to improve. By increasing reserves gradually each year, instead of all at once every three years, the effect on dividends and variable increases will also be more gradual.

#### 8. Experience Study

A study is conducted for WRS every three years to analyze the assumptions that are made in the valuation versus the experience that actually occurred. If the results of the study show material changes in experience, WRS generally adopts a new set of assumptions. When assumptions are changed, this item displays the effect of the change on the dividend/variable rate calculation.

#### 9. Experience and Other Effects

After making all other known adjustments, this is the remainder of all other experience. Changes here are primarily attributable to mortality experience and, generally to a lesser extent, on any data adjustments.

#### 10. Statutory Adjustment to Round/Truncate

By statute, the dividend rate is calculated to the nearest one-tenth of a percent. For the variable annuity change, the rate is truncated to a whole percent. This is the adjustment made from the calculated dividend/variable annuity rate change without rounding/truncation to the statutory rate.

#### 11. Computed Dividend Rate/Variable Annuity Change.

This is the end of year asset value divided by the end of year liability. It is reconciled to the published earnings rate (Item 1) by making the adjustments in items 4 through 10.

February 26, 2007

Mr. David Stella Wisconsin Department of Employee Trust Funds P.O. Box 7931 Madison, Wisconsin 53707

#### **Re: Retired Life Actuarial Valuation**

Dear Dave:

Enclosed are 75 copies of the report of the December 31, 2006 Retired Lives Actuarial Valuation.

Sincerely,

Wach Bri

Mark Buis

MB:dm Enclosures