NOV 0 8 1999

November 5, 1999

Mr. Scott Dennison, Research Director
Wisconsin Joint Survey Committee
    on Retirement Systems
110 E. Main
Tenney Plaza, Room 722
Madison, Wisconsin 53703

Re: AB495 Study

Dear Scott:

Enclosed are 30 copies of our report. Please let us know if additional bound copies are needed.

You will see that our approach regarding retirement probabilities was different than the method suggested in your October 28 letter and related spreadsheets. Your extensive work should qualify you for continuing education credits from the SOA. In fact, you may wish to condense some of your thoughts and present them to the Pension Committee of the Actuarial Standards Board as they are in the final stages of issuing a new ASOP on the selection of demographic assumptions. However, with regard to this study, we chose to make an adjustment for an expected near term surge in retirements with no change in long-term probabilities. While you are correct in observing that longer service participants generally have higher probabilities of retiring, for WRS it will not necessarily follow that an increase in a persons benefit multiplier would be roughly equivalent to having more service. Reasons include:

- Many people retire with money purchase benefits and so are not affected by the change in multiplier. The TAA transfer will not change long-term money purchase benefit levels. Moreover, present retirement probabilities were derived primarily from experience among participants who were not affected by the interest cap.

- The decision to retire is partly driven by eligibility for early or full Social Security benefits. With the gradual increase in full benefit eligibility to age 67, the higher multiplier will have a less than proportional increase in total retirement income.
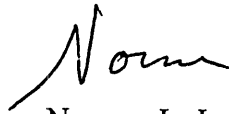
November 5, 1999

- Sick leave accumulations (which finance retiree health benefits) and other savings (e.g. Sec. 457) tend to be service related, but are unaffected by AB495.

- Personal factors such as spouse status and job satisfaction are likewise not changed by the bill.

- Finally, as you observed, this is primarily a past service benefit increase which will have a gradually diminishing effect over time.

You also observed that the balance in the TAA has been volatile and generally declining over recent months. There is always uncertainty about the likely effect of short-term changes in market conditions. We merely commented that actual contribution rates in 2001 will be based on participant and financial data as of December 31, 1999, which is the case whether or not AB495 is enacted.

Your comments and analysis are always thought provoking. I believe the Wisconsin Retirement System benefits from the varying viewpoints of many observers.

Sincerely,

Norman L. Jones

NLJ:md
Enclosures

CC: Mr. David Stella
     Senator Robert W. Wirch
     Representative Daniel P. Vrakas

October 26, 1999

Wisconsin Joint Survey Committee
  on Retirement Systems
110 E. Main, Room 722
Madison, Wisconsin 53703

Ladies and Gentlemen:

Assembly Bill 495 would make a number of changes to the benefit structure of the Wisconsin Retirement System which are briefly summarized below:

- The benefit multiplier in each benefit group (General, Protective Occupation With Social Security, Protective Occupation Without Social Security and Executive & Elected) would be increased by 0.165% for service rendered prior to January 1, 2000.

- The maximum formula benefit would be increased from 65% to 70% of Final Average Earnings for General and Executive & Elected participants.

- The caps on interest credits for post-1981 participants would be removed.

- Death-in-service benefits would be increased to the actuarial equivalent of 2 times a participant's accumulated contributions and eligibility for the special death benefit would be extended to non-spouse dependents.

Assembly Bill 495 would also make a number of changes in WRS financing provisions, including:

- A supplemental $4.0 billion transfer from the Transaction Amortization Account, $200 million of which would be used as an offset to employer contribution requirements in the year 2000.

- An increase in the spread between the assumed rate of future investment return and across-the-board pay increases to 3.4% per year.

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- A phase out of the Transaction Amortization Account to be replaced with a Market Recognition Account in which each year's differences between actual and expected investment returns would be recognized over discrete 5 year periods.

We have been asked to make a statement regarding the expected effect of the benefit and financing changes on computed employer contribution rates for calendar year 2001. Below are our comments with respect to each rate group.

General. The initial computed contribution increases by 0.1% of general participant payroll (approximately $7.5 million per year in current dollars). However, rate changes of less than 0.2% are set aside under WRS financing provisions. Therefore, enactment of Assembly Bill 495 would have no expected effect on contribution requirements in 2001, although there would be upward pressure on rates in subsequent years. It is estimated that increasing the past service multiplier by 0.15% instead of 0.165% would eliminate the 0.1% theoretical increase for the general participant group.

Executive & Elected. The initial computed contribution decreases by 0.1% of executive and elected participant payroll. As with the general participant group, in the absence of net experience gains or losses during 1999, there would be no expected effect on contribution requirements in 2001.

Protective Occupation With Social Security. The initial computed contribution decreases by 0.9% of payroll. In the absence of net experience gains or losses during 1999, this would result in a 0.8% of payroll decline in contribution rates in 2001.

Protective Occupation Without Social Security. The initial computed contribution decreases by 1.4% of payroll. In the absence of net experience gains or losses during 1999, this would result in a 1.4% of payroll decline in contribution rates in 2001.

Weighted Average. There is no change in the computed weighted average contribution rate.

Please note that contribution rates for 2001 will be based upon WRS participant and financial data as of December 31, 1999. At that time, recognition of 1999 experience will very likely result in additional increases or decreases in computed rates.

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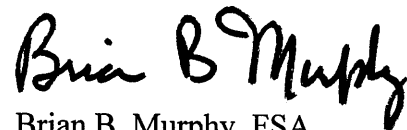
A full-report of our analysis of Assembly Bill 495 will follow within two weeks. The report will include:

- A complete description of proposed benefit and financing changes.

- Measurement of the stand-a-lone cost of benefit changes.

- Comments regarding the added long-term risks of using internal financing mechanisms to offset short-term changes in contribution requirements.

- Other comments regarding long-term financing issues.

Respectfully submitted,

Norman L. Jones, FSA   Brian B. Murphy, FSA

NLJ:BBM:md

CC: Eric Stanchfield
    David Stella
    Representative Vrakas
    ~~Senator Wirch~~
    Dan Caucutt

WISCONSIN RETIREMENT SYSTEM

ACTUARIAL VALUATIONS OF

BENEFIT AND FINANCING PROVISIONS

OF ASSEMBLY BILL 495

PREPARED FOR THE

JOINT SURVEY COMMITTEE ON RETIREMENT SYSTEMS

NOVEMBER 1999

November 5, 1999

Wisconsin Joint Survey Committee
  on Retirement Systems
Madison, Wisconsin

Ladies and Gentlemen:

The results of supplemental actuarial valuations to measure the potential financial effect of changes in benefit provisions and financing mechanisms for the Wisconsin Retirement System (WRS) as provided in Assembly Bill 495 are presented in this report.

Valuations were based upon active and inactive participant data and financial information used in the last regular annual actuarial valuation of the Wisconsin Retirement System as of December 31, 1998, and supplementary financial information furnished by the Department of Employe Trust Funds. Participant data is summarized on the following page.

Actuarial methods and assumptions were, except where otherwise noted, the same as those adopted by the Employe Trust Funds Board in 1997 pursuant to the tri-ennial experience study covering the 3 year period from January 1, 1994 to December 31, 1996. The rates of retirement for participants currently eligible for normal or early retirement were increased by 25% in the first year the new benefit provisions are effective (see discussion on page 14). Actuarial valuations were conducted in accordance with standards of practice prescribed by the Actuarial Standards Board and Wisconsin statutes.

<div align="center">
Respectfully submitted,
Gabriel, Roeder, Smith and Company
</div>

Norman L. Jones, F.S.A.   Brian B. Murphy, F.S.A.

NLJ:BBM:md

-1-

WISCONSIN RETIREMENT SYSTEM

ACTIVE PARTICIPANTS INCLUDED IN VALUATIONS

DECEMBER 31, 1998

Active participants included in the valuations totaled 245,935 with an annual payroll totaling $8,227.5 million, as follows:

ACTIVE PARTICIPANTS

Valuation Group	Number	Annual Earnings ($ millions)	Group Averages			
			Earnings	Age	Years of Service	Partic. Contribs.
General	227,017	$7,456.8	$32,847	44.2	11.3	$38,319
Executive Group & Elected Officials	1,450	73.5	50,664	52.5	11.9	59,292
Protective Occupation with Social Security	14,810	570.3	38,509	38.2	11.1	44,503
Protective Occupation without Social Security	2,658	126.9	47,733	40.0	13.5	79,849
Total Active Participants	**245,935**	**$8,227.5**	**$33,454**	**43.8**	**11.3**	**$39,264**

CHANGES UNDER ASSEMBLY BILL 495

BENEFIT MULTIPLIER

Service Period	Present	AB495	Group
Before 2000	2.0%	2.165%	Executive group, elected officials and protective
After 1999	2.0	2.0	occupation participants covered by Social Security.
Before 2000	2.5	2.665	Protective occupation participants not covered by
After 1999	2.5	2.5	Social Security.
Before 2000	1.6	1.765	All others.
After 1999	1.6	1.6	

MAXIMUM FORMULA BENEFIT LIMITATION

Formula benefits (determined by application of the multiplier to creditable service and final average earnings) are as follows:

Group	Maximum % of FAE	
	Present	AB495
General	65%	70%
Executive and Elected	65	70
Protective Occupation With Social Security	65	65
Protective Occupation Without Social Security	85	85

INTEREST CREDITED TO PARTICIPANT ACCOUNTS

Participant accounts are credited with interest annually as follows:

| | Rate Credited for Purpose of | |
Date of Participation	Money Purchase Minimum	Refunds
Present		
Prior to 1982	Actual	Actual
January 1, 1982 & Later	5%	3%
Proposed	Actual	Actual

DEATH-IN-SERVICE BENEFITS

Plan	Eligible Group	Amount
Present	Participants age 55 (50 for Protective Occupations) or over with 5 or more years of service with an eligible spouse or dependent children.	Survivor annuity equal to the amount that would have been paid if participant had retired and elected the 100% survivor option.
	All other participants.	Refund of accumulated contributions.
AB495	Participants age 55 (50 for Protective Occupants) or over with 5 or more years of service with an eligible spouse or dependent or other person with a beneficial interest in the life of the participant.	At the option of the survivor, either (i) a monthly annuity as under present plan, or (ii) a lump sum equal to 2 times participant's accumulated contributions.
	All other participants.	A lump sum (or actuarially equivalent annuity) equal to 2 times participant's accumulated contributions.

- Supplemental transfer of $4.0 billion from the Transaction Amortization Account (TAA) to be allocated proportionately to the Fixed Annuity Reserve, Participant Contribution Reserve and Employer Accumulation Reserve. $200 million of the transfer to the Employer Accumulation Reserve will be used as a credit to pay down UAAL balances or otherwise to pay required contributions.[1]

- Increase the spread between the assumed rate of future investment income and across-the-board pay increases to 3.4% per year as follows:

Assumption	Present	Proposed
Net investment income	8.0%	8.0%
Wage inflation	4.8	4.6
Spread	3.2%	3.4%

[1] The Employer Accumulation Reserve represented 30.9% of total Fixed Annuity Reserves as of December 31, 1998. To achieve a net $200 million for the temporary rate credit required the use of $647 million of the total $4.0 billion transfer ($647 million x 30.9% = $200 million).

Summary of Valuation Results

WRS PROPOSALS UNDER CONSIDERATION

SUMMARY OF VALUATION RESULTS

BASED ON CURRENT ACTUARIAL ASSUMPTIONS

	General	Executive & Elected	Protective Occupations	
			With Social Security	Without Social Security
Present Average Contribution Rate				
For - 1999	11.6%	15.1%	13.8%	19.7%
- 2000	11.0	14.7	12.1	17.7
Change in rates resulting from				
• Increase in past service multiplier and increase in maximum benefit	0.6	0.9	0.6	0.9
• Repeal of interest caps and increase in death-in-service benefits	0.5	0.3	0.2	0.1
• Stand-alone cost of benefit increases	1.1	1.2	0.8	1.0
• Increase in spread	(0.3)	(0.2)	(0.5)	(0.7)
• TAA transfer	(0.7)	(1.1)	(1.2)	(1.7)
• **Net change in computed rates**	**0.1**	**(0.1)**	**(0.9)**	**(1.4)**
Illustrative rates after changes #	11.1%	14.6%	11.2%	16.3%

 # The contribution rates after all changes are illustrative only. Contribution rates for 2000 have already been set. Rates for 2001 will only be determined after actual benefit changes have been enacted and participant and financial data have been updated through December 31, 1999. Because of the inter-relationship of benefit provisions, the combined effect of various changes is sometimes more and sometimes less than the sum of the parts.

Additional discussion of proposed funding mechanisms are presented on the following pages.

Discussion of Funding Mechanisms
and Asset Valuation Method
and
Concluding Comments

DISCUSSION OF ALTERNATE FINANCING MECHANISMS

SUPPLEMENTAL TAA TRANSFER

Financing a benefit increase with a supplemental transfer from the TAA is a means of capitalizing (i.e., recognizing now) gains that otherwise are expected to flow through to the system more gradually in future years. This financing source should be used sparingly and with recognition of long-term implications for WRS:

- The additional fixed annuity dividend generated in the first year would be followed by dividends that are smaller than they otherwise would have been in subsequent years.

- The increase in participant account balances will increase money purchase benefits for some WRS participants retiring in the first few years following the transfer.

- Funds that are used to pay for new benefits would otherwise have been available to reduce contribution rates (or at least minimize rate increases if overall experience is unfavorable) or finance other benefit increases at some future date.

- Changing the flow of funds from the TAA to the various fixed reserves affects the distribution of WRS benefits among individual participants. Equity and legal issues are not treated in this report.

- Investment markets are volatile; the TAA is intended to provide a mechanism to lessen the extent to which such volatility may flow through to computed contribution rates. Use of the TAA for other purposes reduces the extent to which it can be used for its intended purpose, thereby increasing potential future volatility in dividends and contribution rates.

- While the TAA was higher on December 31, 1998 than it has ever been historically, so were both the assets and liabilities of WRS. Also, the present economic expansion is one of the longest on record. When investment markets are strong, the TAA is expected to be high; when investment markets are weak, the TAA is expected to be low. The present level of the TAA should be viewed within this context.

- Each year, 20% of the TAA is transferred to the Fixed Trust Funds. These transfers have produced recognized investment gains in most recent years. However, as recently as 1994, the transfer, when combined with ordinary income, was not sufficient to meet the 8% investment return assumption that is used in developing WRS contribution rates.

ESTIMATED DISTRIBUTION OF
ACCELERATED $4.0 BILLION TAA TRANSFER
($ MILLIONS)

Reserve Account	Fixed Annuity Reserves		Approximate TAA Transfer
	12/31/98	%	
Annuity Reserves	$14,950.1	40.2%	$1,608
Participant Normal	9,888.7	26.6	1,064
Participant additional	99.0	0.3	12
Employer	11,499.3	30.9	1,236*
Other programs	727.1	2.0	80
Total (est.)	$37,164.3	100.0%	$4,000

* $200 million of the employer share of the transfer would offset employer contributions otherwise payable in calendar year 2000. The remainder would be credited to employer reserves.

ECONOMIC ASSUMPTIONS

Economic assumptions include long-term rates of investment return and wage inflation (the across-the-board portion of salary increases). Unlike demographic activities, economic activities do not lend themselves to analysis solely on the basis of internal historical patterns because both salary increases and investment return are more affected by external forces; namely inflation and general productivity changes which defy accurate long-term prediction. Estimates of economic activities are generally selected on the basis of the expectations in an inflation-free environment and then both are increased by some provision for long-term inflation.

If inflation and/or productivity increases are higher than expected, it will probably result in both actual rates of salary increases and investment return which exceed the assumed rates. Salaries increasing faster than expected produce unexpected liabilities. Investment return exceeding the assumed rates (whether due to manager performance, change in the mix of assets, or general market conditions) results in unanticipated assets. To the extent that inflation, productivity, and other factors have about the same effect on both sides of the balance sheet, these additional assets and liabilities can offset one another over the long-term.

Wage inflation. Average salaries in WRS have risen at a slower pace than 4.8% a year since 1981 (the average has been under 4.5%). The rate of increase in National Average earnings since 1981 has averaged 4.6% a year. It is expected that in the long run, salary increases in all parts of the country will be close to the national averages.

Investment Return and Spread. The WRS asset mix has increased from about 30% to 60% in equities over the last 10 years. Real market returns (the difference between net recognized investment return and wage inflation) through 1998 for portfolios with comparable equity holdings have substantially exceeded 3.2% over most measurement periods. However, when the extraordinary experience of the last 5 years is factored out, long-term real returns are only slightly higher than the current assumption.

Only hindsight will tell whether a particular combination of economic assumptions is optimal. If future economic patterns are as favorable as they have been in the recent past, increasing the spread would prove to be a reasonable means to finance a benefit increase. If, on the other hand, the spread is increased, and the assumed favorable experience does not materialize, a contribution increase would become likely at some future date. The following economic assumptions were used in the valuations.

	Present	AB495
Investment return	8.0%	8.0%
Wage inflation	4.8	4.6
Spread	3.2	3.4

WISCONSIN RETIREMENT SYSTEM
STATUTORY ASSET VALUATION METHOD

An essential step in the valuation process is comparing valuation assets with computed liabilities. Valuation assets are those assets that are recognized for funding purposes.

Asset valuation methods are distinguished by the timing of the recognition of investment income. Total investment income is the sum of ordinary income and capital value changes. Under a pure market value approach, ordinary investment income and all capital value changes would be recognized immediately. Because of market volatility, use of pure market values in retirement funding can result in volatile contribution rates and unstable financial ratios, contrary to WRS objectives.

Under the statutory WRS asset valuation method, all ordinary income plus 20% of previously unrecognized capital value changes are recognized each year. The objective is to give recognition to long term changes in asset values while minimizing effect of short term fluctuations in the capital markets. Realized and unrealized capital gains and losses are treated in the same manner.

Capital value changes are recorded in the Transaction Amortization Account (TAA), which is maintained by the investment board. A summary of recent TAA activity follows.

	$ Millions					
	1998	1997	1996	1995	1994	1993
Beginning Balance January 1	$ 9,801	$ 7,405	$ 5,892	$ 2,484	$ 4,313	$ 2,978
Closing Adjustments	0	0	0	(40)	0	0
Net Gains (Losses)	4,583	4,872	3,393	4,982	(1,194)	2,440
Adjustment for City of Milwaukee	(15)	(26)	(28)	(62)	(14)	(27)
Ending Balance Before Transfer	14,369	12,251	9,256	7,365	3,105	5,391
20% Transfer to Fixed Trust Funds	2,874	2,450	1,851	1,473	621	1,078
Ending Balance December 31	**11,495**	**9,801**	**7,405**	**5,892**	**2,484**	**4,313**
Statutory Value of Assets	43,391	38,585	33,963	30,246	26,954	25,437
Market Value of Assets	54,885	48,385	41,368	36,138	29,438	29,749
Ratio	79%	80%	82%	84%	92%	86%

MARKET RECOGNITION ACCOUNT

While the use of the TAA has produced reasonable results in the past, it has a number of shortcomings, including:

(i) The present structure is not easily understood and may leave the impression that surpluses exist even when actual and assumed experience are the same. This is so because a balance of approximately 20% of fixed annuity reserves is generally required to meet the underlying 8% investment return assumption.

(ii) The open nature of the recognition of capital value changes (20% annual transfer of year end balances) results in a high TAA growth rate in rising markets. In theory, capital value changes in any given year are never fully recognized. (It takes 10 years to recognize 90% of any given year's activity.) Conversely, in years when the market returns exactly match the assumption, the recognized rate of return falls below the assumed rate because only 20% of the capital value component of total return is immediately recognized.

A method of recognizing market activity that has gained in popularity in recent years works as follows. Assumed investment return is recognized fully each year. Differences between actual and assumed investment return are phased in over a closed period (5 years in AB495). During periods when investment performance exceeds the assumed rate, the funding value will tend to be less than the market value. Conversely, during periods when investment performance is less than the assumed rate, funding value will tend to be greater than market value. If assumed rates are exactly realized for 4 consecutive years, funding value will become equal to market value. The schedule on the following page demonstrates how this method would have operated if it had been in place over the last 5 years.

ILLUSTRATIVE OPERATION OF AN MRA FOR THE FIXED PORTFOLIO
BASED ON A JANUARY 1, 1994 BEGINNING DATE
(IN $ MILLIONS)

	1994	1995	1996	1997	1998
Beginning of Year:					
A. Funding Value of Fixed Portfolio	$23,380.1	$25,744.6	$29,027.4	$33,021.3	$38,037.0
B. Market Value of Fixed Portfolio	27,693.0	27,531.6	33,476.6	38,091.0	44,266.7
End of Year:					
C. Market Value	27,531.6	33,476.6	38,091.0	44,266.7	50,004.7
D. Non Investment Net Cash Flow	45.5	(0.7)	(12.9)	(21.5)	(273.1)
E. Investment Income					
E1. Market Total: C – B – D	(206.9)	5,945.7	4,627.3	6,197.2	6,011.1
E2. Assumed Rate	8.00%	8.00%	8.00%	8.00%	8.00%
E3. Amount for Immediate Recognition	1,872.2	2,059.5	2,321.7	2,640.8	3,032.0
E4. Amount for Recognition from TAA	862.6	862.6	862.6	862.6	862.6
E5. Amount for Phased-In Recognition: E3 – E4	(2,079.1)	3,886.2	2,305.6	3,556.4	2,979.1
F. Phased-In Recognition of Investment Income					
F1. Current Year: 0.20 x E5	(415.8)	777.2	461.1	711.3	595.8
F2. First Prior Year	0.0	(415.8)	777.2	461.1	711.3
F3. Second Prior Year	0.0	0.0	(415.8)	777.2	461.1
F4. Third Prior Year	0.0	0.0	0.0	(415.8)	777.2
F5. Fourth Prior Year	0.0	0.0	0.0	0.0	(415.8)
F6. Total MRA Phase-in	(415.8)	361.4	822.5	1,533.8	2,129.6
G. Funding Value: A + D + E3 + E4 + F6	25,744.6	29,027.4	33,021.3	38,037.0	43,788.1
H. Difference Between Market & Funding Values	1,787.0	4,449.2	5,069.7	6,229.7	6,216.6
I. MRA Recognized Rate of Return	9.9%	12.8%	13.8%	15.3%	15.9%
J. Actual TAA Mean Balance Rate of Return*	6.9%	10.1%	11.3%	12.4%	12.6%

* Note: Mean balance returns are close, but not equal to published earnings rates.

COMMENT

This schedule shows that in the rising market environment of the last five years, the MRA would have consistently produced a higher recognized rate of return. As a result, the ending $6.2 billion difference between market and funding values (line H) would have been much less than the $11.5 billion ending balance in the TAA.

CONCLUDING COMMENTS

- Although its effects are not uniform among all groups, Assembly Bill 495 is in close financial balance with respect to the expected effect on contribution rates in 2001. The theoretical effects on computed rates by division and in aggregate are:

General. The initial computed contribution increases by 0.1% of general participant payroll (approximately $7.5 million per year in current dollars). However, rate changes of less than 0.2% are set aside under WRS financing provisions. Therefore, enactment of Assembly Bill 495 would have no expected effect on contribution requirements in 2001, although there would be upward pressure on rates in subsequent years. It is estimated that increasing the past service multiplier by 0.15% instead of 0.165% would eliminate the 0.1% theoretical increase for the general participant group. Increasing the TAA transfer from $4.0 to $4.5 billion would also achieve near term rate neutrality for the general participant group.

Executive & Elected. The initial computed contribution decreases by 0.1% of executive and elected participant payroll. As with the general participant group, in the absence of net experience gains or losses during 1999 there would be no expected effect on contribution requirements in 2001.

Protective Occupation With Social Security. The initial computed contribution decreases by 0.9% of payroll. In the absence of net experience gains or losses during 1999 this would result in a 0.8% of payroll decline in contribution rates in 2001.

Protective Occupation Without Social Security. The initial computed contribution decreases by 1.4% of payroll. In the absence of net experience gains or losses during 1999 this would result in a 1.4% of payroll decline in contribution rates in 2001.

Weighted Average. There is no change in the computed weighted average contribution rate. If the past service multiplier increase is limited to 0.15% for all groups or if the TAA transfer is increased to $4.5 billion, there will be a small reduction in the weighted average rate.

no increase to employers   *there would*

rate cut

- Actual contribution rates for 2001 will be based upon WRS participant and financial data as of December 31, 1999. At that time, recognition of 1999 experience will very likely result in additional increases or decreases in computed rates.

- Use of internal funding mechanisms for offsetting the stand-alone cost of benefit increases adds to the risk that rate increases will be required in future years (see discussion on pages 7 and 9).

- AB495 also provides for the re-opening of the Variable Annuity Program. Our report to the JSCRS dated August 4, 1999 presents our findings on the potential financial effect of that change in the WRS benefit structure.

- Changes in benefit structures often have an effect on employment patterns. In particular, a substantial increase in benefit levels often lead to accelerated retirements. However, the effect of any particular change cannot be accurately forecast. The normal practice is to incorporate any changes in underlying patterns after they have been monitored over a period of years. Under AB495, formula benefits are increased only with respect to past service. The $4.0 billion TAA transfer initially results in higher money purchase minimum balances, but funds would eventually flow to participant accounts even if there were no legislative changes. Moreover, current retirement patterns are based mostly on experience among participants not subject to interest caps. Finally, retirement decisions are based on a broad range of factors beyond the absolute benefit level. In light of these considerations, it was our judgment that continued use of existing demographic assumptions adjusted for a short-term acceleration in the number of retirements was appropriate for this study. Accordingly, regular retirement rates were increased by 25% in the first year the new benefits are effective.

Summary of Actuarial Assumptions

SUMMARY OF ASSUMPTIONS
USED FOR ANNUAL ACTUARIAL VALUATIONS
ASSUMPTIONS ADOPTED BY ETF BOARD AFTER
CONSULTING WITH ACTUARY

ECONOMIC ASSUMPTIONS

The long-term rate of investment return used in the valuation was 8.0% a year, compounded yearly.

Dividends for present and future retirees are assumed to be 2.86% each year.

Salary adjustment factors used to project earnings for each participant between the valuation date and the participant's retirement age are shown below for sample ages. This assumption is used to project a participant's current earnings to the earnings upon which benefits will be based.

	% Increase in Salaries Next Year								
	Merit				Base (Economy)*	Total			
Age	Gen.	Teachers	Protective	Exec. & Elec.		Gen.	Teachers	Protective	Exec. & Elec.
20	5.0%	6.0%	6.0%	5.0%	4.8%	9.8%	10.8%	10.8%	9.8
25	5.0	5.4	6.0	5.0	4.8	9.8	10.2	10.8	9.8
30	3.2	4.4	3.1	3.2	4.8	8.0	9.2	7.9	8.0
35	2.2	3.4	1.6	2.2	4.8	7.0	8.2	6.4	7.0
40	1.3	2.4	0.9	1.3	4.8	6.1	7.2	5.7	6.1
45	0.7	1.5	0.5	0.7	4.8	5.5	6.3	5.3	5.5
50	0.4	0.8	0.3	0.4	4.8	5.2	5.6	5.1	5.2
55	0.3	0.4	0.1	0.3	4.8	5.1	5.2	4.9	5.1
60	0.3	0.3	-	0.3	4.8	5.1	5.1	4.8	5.1
65	0.2	0.2	-	0.2	4.8	5.0	5.0	4.8	5.0
Ref:	561	563	562	561					

* Reduced to 4.6% under AB495.

If the number of active participants remains constant, then the total active participant payroll will increase 4.8% a year, the base portion of the individual salary increase assumptions. This increasing payroll was recognized in amortizing unfunded actuarial accrued liabilities.

DECREMENT PROBABILITIES

The mortality table used to measure mortality for retired participants was the Wisconsin Projected Experience Table – 96 for men and women. Sample retirement values from this table are shown below. This assumption is used to measure the probabilities of participants dying before retirement and the probabilities of each benefit payment being made after retirement.

SINGLE LIFE RETIREMENT VALUES
WISCONSIN PROJECTED EXPERIENCE TABLE – 96 WITH 5% INTEREST

Sample Attained Ages	Present Value of $1 Monthly for Life		Future Life Expectancy (years)	
	Males	**Females**	**Males**	**Females**
40	$203.49	$213.51	39.7	45.1
45	193.18	205.50	34.9	40.3
50	180.98	195.63	30.2	35.4
55	166.76	183.57	25.7	30.7
60	150.13	168.96	21.4	26.1
65	131.03	151.77	17.3	21.6
70	110.56	131.92	13.5	17.3
75	90.31	110.50	10.3	13.4
80	70.75	89.29	7.6	10.1
85	54.29	69.03	5.5	7.3

For disability retirements basing mortality on an age 12 years older than the actual age recognizes impaired longevity.

Sample Attained Ages	Mortality Rates	
	Males	Females
20	0.000145	0.000085
25	0.000179	0.000113
30	0.000234	0.000153
35	0.000324	0.000212
40	0.000472	0.000305
45	0.000844	0.000454
50	0.001526	0.000699
55	0.002460	0.001057
60	0.003788	0.001782
65	0.006433	0.003126
70	0.011998	0.005513
75	0.020418	0.011278
80	0.035773	0.020671

This assumption is used to measure the probability of participants dying while in service.

RATES OF RETIREMENT FOR THOSE ELIGIBLE TO RETIRE

Normal Retirement Pattern#

| Age | % Retiring Next Year | | | | | | | | |
| | General | | Public School | | University | | *Protective | | Exec. & Elected |
	Male	Female	Male	Female	Male	Female	With S.S.	W/OS.S.	
50							4%	3%	
51							4	3	
52							4	3	
53							25	25	
54							25	25	
55							25	30	
56							25	35	
57	12%	12%	20%	15%	10%	20%	25	40	6%
58	15	15	20	15	12	20	25	40	6
59	20	20	20	15	13	20	25	40	6
60	20	20	20	15	13	20	25	40	8
61	25	30	25	15	15	20	25	40	8
62	40	40	45	30	25	20	40	40	18
63	40	40	45	20	25	20	40	30	18
64	40	40	45	20	25	20	40	30	18
65	55	55	55	40	30	38	40	30	30
66	40	52	50	35	30	38	40	30	30
67	40	40	40	35	25	25	40	30	30
68	35	35	40	30	25	25	40	30	30
69	35	35	40	30	25	25	40	30	30
70	35	35	40	30	25	25	100	100	35
71	35	35	40	30	25	25	100	100	40
72	100	100	100	100	100	100	100	100	100

* Includes early retirements.

Early Retirement Pattern#

| Age | % Retiring Next Year | | | | | | |
| | General | | Public School | | University | | Exec. & Elected |
	Male	Female	Male	Female	Male	Female	
55	5%	5%	8%	7%	5%	7%	6%
56	5	5	8	7	5	7	6
57	5	6	8	8	5	7	6
58	5	6	12	9	5	8	6
59	5	7	12	10	5	10	6
60	6	10	25	12	5	10	6
61	8	10	25	15	5	10	6
62	25	25	25	28	13	15	
63	25	25	25	25	13	15	
64	25	25	25	25	13	15	

Rates increased by 25% in first year after benefit increases are effective.

The assumed rates of separation from employment prior to service retirement due to disability and other causes are shown below for sample ages. For other terminations it was assumed that a percentage depending on age of participants terminating after age 35 with 5 or more years service will leave their contributions on deposit and be paid a benefit at normal retirement age and that the remaining participants would take a separation benefit. The percentage is 100% at age 35, grading downward to 0% at retirement eligibility. These assumptions are used to measure the probabilities of participants remaining in employment and the probabilities of being paid a disability or other termination benefits.

ASSUMED TERMINATION RATES
BY ATTAINED AGE AND YEARS OF SERVICE

| Age & Service | | Protective | | Public Schools | | University | | Exec. & Elected | Other | |
		With Soc. Sec.	Without Soc. Sec.	Males	Females	Males	Females		Males	Females
	0	7.0%	5.0%	14.0%	14.0%	18.0%	20.0%	N/A%	14.0%	16.0%
	1	5.0	2.0	11.0	12.0	17.5	20.0	N/A	10.0	12.0
	2	4.0	2.0	9.0	9.0	15.0	18.0	N/A	7.0	9.0
	3	3.5	1.7	8.0	8.0	15.0	15.5	N/A	6.0	7.5
	4	3.0	1.7	6.0	7.0	12.5	13.0	N/A	5.0	7.0
25	5 & Over	3.0	1.2	5.4	6.9	12.3	12.9	10.6	4.8	6.9
30		2.3	1.0	3.8	5.3	11.3	11.7	9.7	3.9	5.8
35		1.6	0.8	2.2	3.1	8.1	8.1	7.9	2.9	4.1
40		1.3	0.6	1.5	1.9	5.0	5.6	6.1	2.1	3.2
45		1.1	0.5	1.2	1.5	3.1	4.4	4.8	1.6	2.7
50		-	-	1.1	1.5	1.8	3.2	3.5	1.3	2.5
55		-	-	1.1	1.3	1.6	2.8	3.0	1.1	1.5
60		-	-	1.1	1.0	1.3	2.8	3.0	1.1	0.5

DISABILITY RATES

| Age | Protective | | Public Schools | | University | | Exec. & Elected | | Other | |
	With SS	W/O SS	Males	Females	Males	Females	Males	Females	Males	Females
20	0.04%	0.08%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.04%	0.03%
25	0.05	0.08	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.03
30	0.06	0.10	0.03	0.02	0.02	0.02	0.03	0.02	0.05	0.04
35	0.08	0.12	0.03	0.03	0.02	0.05	0.03	0.03	0.05	0.05
40	0.12	0.15	0.04	0.04	0.03	0.08	0.05	0.05	0.09	0.08
45	0.18	0.22	0.07	0.07	0.05	0.10	0.08	0.08	0.15	0.13
50	0.59	0.66	0.17	0.12	0.09	0.14	0.16	0.13	0.30	0.22
55	0.88	1.03	0.33	0.25	0.18	0.27	0.32	0.24	0.60	0.39
60	0.98	1.17	0.52	0.44	0.32	0.39	0.58	0.39	1.00	0.64