REVIEW OF THE ADEQUACY OF THE CONTRIBUTION RATES TO OP&F, SERS AND STRS

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I. Introduction

Pursuant to the request of the Ohio Retirement Study Council, "ORSC", the purpose of this report is to review the adequacy of the contribution rates to:

- the Ohio Police & Fire Pension Fund, "OP&F";
- the School Employees' Retirement System of Ohio, "SERS"; and,
- the State Teachers' Ret

The following table summarizes the market value of assets and the current membership

Retirement System's Statistics

System	Market Value of Total System Assets	Active Members	Inactive Members	Retired Members and Beneficiaries
OP&F*	$7,441,072,313	28,343	2,007	23,923
SERS**	7,558,666,711	120,254	81,638	59,349
STRS**	47,923,100,000	178,557	124,584	105,300
Total	**$62,922,839,024**	**327,154**	**208,229**	**188,572**

* Figures are as of December 31, 2002
** Figures are as of June 30, 2002

This review is in response to the significant decline in each of the retirement system's assets from the spring of 2000 to the spring of 2003 due to the general market decline during that period. As a result, each of the system's actuarial status has eroded.

This review is to determine whether the current contribution rates, which are established by statute, remain adequate to fund the retirement systems and, if not, indicate the magnitude of changes in contribution rates and/or benefit provisions that may be appropriate to restore each system's actuarial status.

The analysis that follows addresses primarily the pension benefits and Medicare Part B reimbursements mandated by the Legislature in Ohio statutes. It addresses discretionary healthcare benefits only to the extent that a portion of the maximum statutory rates is currently allocated to provide such benefits. To the extent that the portion of contributions allocated to such discretionary benefits is redirected to restore the actuarial status of each system's mandated pension benefits and Medicare Part B reimbursements, the discretionary benefits will need to be reduced or eliminated.

In general, this review is based on the results of the most recent Actuarial Valuation prepared for each of the three systems - January 1, 2003 in the case of OP&F and July 1, 2002 in the case of SERS and STRS. Each of the systems and their consulting actuary provided us with the detailed participant data and actuarial assumptions that were used to prepare the valuation so we could base our calculations on consistent information. Except where we indicate that some change was made, we used those assumptions without modification throughout this review. In addition, each of the systems provided us with the Capital Market Assumptions they used for updating their investment policy. We want to thank them for their cooperation and prompt responses to our requests and questions.

In light of the significant rebound in the financial markets between mid-March and June 30, 2003, we estimated the effect of that market recovery on the actuarial status of each of the systems as of June 30, 2003. This estimate was based on the returns reported by the systems through June 30, 2003.

In performing this analysis, we relied on the data and other information provided by the systems and their consulting actuaries. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. It is certain that actual experience will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

II. Summary

The major findings and recommendations from this review are summarized below.

- As of July 1, 2003, none of the systems satisfied the 30-year funding period required by law (in the case of OP&F, this means being on track to satisfy that requirement at the end of 2006).

- The funding period calculation required by law should be based on the actuarial costs of all benefits mandated by statute - the pension benefits and the Medicare Part B premium reimbursements. SERS is the only system that includes the statutorily mandated Medicare Part B premium reimbursements in the development of its funding period. We recommend that both OP&F and STRS include these statutorily mandated benefits when determining their funding periods in future actuarial valuations.

- Significant "excess" investment returns will be needed over the near term by each of the systems to "catch-up" with the actuarial value of assets that is used by each of the systems to determine its funding period. For example, OP&F would need to earn annualized investment returns of approximately 11.7% over the next 5 years to "catch-up". The comparable figures for SERS and STRS are 12.5% and 9.6%, respectively.

- The Capital Market Assumptions used by the systems for investment planning purposes anticipate that actual returns will fall short of the long-term actuarial investment return assumption over the next 10 years. (The actuarial investment return assumption is 8.25% for OP&F and SERS and 7.75% for STRS.) Thus based on those Capital Market Assumptions, there is less than a 50% chance that the systems will even meet the long-term actuarial investment return assumption over the next 10 years, let alone earn "excess" returns to "catch-up" with the actuarial value of assets used for purposes of determining compliance with the 30-year limit required by law.

- If neither contributions nor benefits are modified, based on the average Capital Market Assumptions used by these systems for investment planning purposes there is only a 17% probability that OP&F will be in compliance with the 30-year limit on the funding period even 10 years from now, in 2014. Based on the same assumptions, there is only about a 19% probability that SERS and a 28% probability that STRS would comply with the 30-year limit in 2014.

- If actual investment returns over the next 5 years are somewhat favorable so that they meet the long-term actuarial investment return assumption of the Boards (but do not produce "excess" returns to "catch-up" to the actuarial value of assets),

  - SERS could bring itself into compliance with the 30-year funding period limit by reducing its allocation to discretionary healthcare benefits from 5.83% to 1.0% and redirecting those contributions to mandated benefits. This would require a reduction in the discretionary healthcare benefits of roughly 65% (assuming that SERS continued to assess the employer healthcare surcharge) and,
  - Neither OP&F nor STRS could comply with the 30-year limit even if all contributions were allocated to mandated benefits. This would mean that no contributions would remain available to be allocated to discretionary healthcare benefits.
  - If little or no contributions were allocated to discretionary healthcare benefits, those benefits would have to be significantly reduced immediately and eliminated when the healthcare fund is exhausted. (As of the most recent actuarial valuations, the healthcare fund in OP&F was adequate to pay healthcare benefits for 1.3 years. The comparable figures for SERS and STRS are 1.8 years and 6.9 years, respectively.) Alternatively, healthcare benefits could be offered to retirees with the retiree required to pay the full cost. This latter alternative would at least allow retirees to retain their current coverage if they choose to pay for it.

- If investment returns over the near term are quite favorable so that the systems' investments earn "excess" returns sufficient for the assets to "catch-up" with the actuarial value,

  - Both OP&F and SERS could bring themselves into compliance with the 30-year limit on the funding period by reducing the contributions allocated to discretionary healthcare benefits and redirecting them to mandated benefits. In the case of OP&F, this would reduce the allocation to discretionary healthcare benefits from 7.75% to roughly 1.4% of payroll. Such a reduction in the contributions allocated to discretionary healthcare benefits would require a reduction in discretionary healthcare benefits of roughly 80%. The comparable figures for SERS are a reduction in the discretionary healthcare contribution rate from 5.83% to 4.8%, and a reduction in benefits of roughly 15% (assuming that SERS continued to assess the employer healthcare surcharge); and,
  - STRS could not bring themselves into compliance with the 30-year limit on the funding period even if they completely eliminate the allocation to discretionary benefits and redirect all contributions to mandated benefits. Eliminating the allocation to discretionary healthcare benefits would force the elimination of these discretionary benefits as soon as the healthcare fund is exhausted.

- If the systems continue to allocate to discretionary healthcare benefits the portions of the contributions indicated in the most recent actuarial valuations, one or more of the following steps will need to occur.

  - The statutory employer and/or member contribution rate limitations will need to be increased.
  - State subsidies will need to be provided to the systems.
  - The benefits mandated by statute will need to be reduced.
  - The 30-year limit on the funding period required by law will need to be extended.

- If infinite funding periods were allowed to persist, the systems would be gradually disfunded.

III. Information as of the most recent actuarial valuations

The unfunded actuarial accrued liabilities for pension benefits, "UAL", and funding periods as reported in the most recent actuarial valuations of OP&F, SERS and STRS are summarized in the table below.

Reported UAL and Funding Period
($ amounts in billions)

	OP&F	SERS	STRS
Valuation Date:	January 1, 2003	July 1, 2002	July 1, 2002
UAL:	$1.8	$1.1	$14.3
Funding Period:	Infinite	30 years	39 years

Based on the above figures, only SERS met the requirement in law that the Board of each system keep the funding period at 30 years or less (in the case of OP&F, the Board has until the end of 2006 to achieve a 30 year funding period). When the funding period for a system exceeds 30 years, its Board is required to develop a plan and submit it to the ORSC and the Legislature to bring the funding period back to within the 30-year limit.

Significance of "Funding Period"

In order for a retirement system to be "actuarially sound", it needs to have sufficient assets and dedicated future contributions to cover the actuarial value of all benefits it will pay. Since the Ohio Retirement Systems use the Entry Age Actuarial Cost Method, this means that the future employer and member contributions must be adequate to pay each system's normal cost and amortize its UAL over some reasonable timeframe. If the contributions are not adequate to cover the normal cost and amortize the UAL, the system's UAL will grow indefinitely, gradually disfunding the retirement system.

The fact that the UAL grows over the short term does not mean that the retirement system is actuarially ***un***sound. Some amortization schedules will produce increasing UALs over the near term even though the scheduled amortization payments will ultimately fully fund the UAL. Moreover, fluctuations in investment and other actuarial experience should be expected. Such fluctuations will cause the UAL to increase or decrease from year to year.

But if a retirement system has an infinite funding period for the UAL, it means that the UAL is expected to grow over both the short and long term; in fact, it is expected to continuously grow into the future. This should be deemed to be an unacceptable situation. Requiring the Boards to develop a plan to bring the funding period below infinity to some finite period of years is appropriate.

The exact length of the appropriate funding period is, of course, open to debate. Thirty years has become a generally accepted time period for this purpose over the past few decades. For example, ERISA required private sector pension plans to move to maximum 30-year funding period for UALs when it was enacted in 1974. Within the public sector, the Governmental Accounting Standards Board, "GASB", selected 30-years as the maximum funding period for UALs also. (In the case of both ERISA and GASB, retirement programs were given a longer period of 40 years for UALs existing when the new rules became effective. In the case of the GASB rules, this 40-year alternative will expire in 2006.)

In light of this background, the 30-year period established by Ohio statute falls well within generally accepted practice.

Use of "Actuarial Value of Assets"

The figures shown on the previous page reflect the systems' "actuarial value of assets". The actuarial value of assets is calculated by phasing-in the recognition of market returns to the extent that they deviate from the actuarial assumption regarding long-term investment returns. This value is intended to dampen fluctuations in the value of assets used to determine long-term funding progress. (Most public employee retirement systems make use of an actuarial value of assets in lieu of the market value.) The three systems phase-in the short-term deviations from the assumed long-term rate of investment return over 5 years in the case of OP&F and over 4 years in the case of SERS and STRS. (OP&F and STRS limit the deviation between the actuarial value and market value of assets to 20% in the case of OP&F and 9% in the case of STRS.)

After an extended period when actual investment returns are significantly higher or lower than long-term average expected returns, as over the 3-year period ending March 31, 2003 when returns were negative, the difference between the actuarial value and the market value of assets can become quite large. The actuarial value of assets for each system as of the most recent actuarial valuation is compared below with the market value of assets as of the same date.

Comparison of Actuarial and Market Value of Assets
($ amounts in billions)

	OP&F	SERS	STRS
Valuation Date:	January 1, 2003	July 1, 2002	July 1, 2002
Actuarial Value of Pension Assets:	$8.7	$8.9	$48.9
Market Value of Pension Assets:	7.2	7.2	44.9
Difference in $:	1.5	1.7	4.0
Difference as % of MV:	20%	23%	9%
Actuarially assumed long-term average rate of investment return:	8.25%	8.25%	7.75%

Roughly speaking, the investment returns on the market value of assets in OP&F would have to exceed the actuarially assumed long-term average expected rate of return of 8.25% by $1.5 billion over the next 5 years in order for the market value to "catch-up" with the actuarial value of assets. Similarly, the investment returns in SERS and STRS would need to generate $1.7 and $4.0 billion of such excess returns over the next 4 years for the market value to "catch-up" with the actuarial value of assets. Otherwise, the funding periods will grow beyond the figures shown above, which were based on the actuarial value of assets.

For example, if actual returns on investments over the 5 years following the most recent actuarial valuation (4 years in the case of SERS and STRS) only equal the actuarially assumed long-term average rate, the systems' funding periods would grow to the following.

Growth in Funding Period if no "excess" returns
($ amounts in billions)

	OP&F	SERS	STRS
Adjusted Funding Period:	Infinite	Infinite	75 years

Thus none of the three systems will be able to satisfy the 30-year funding period target without significant "excess" returns over the next 4 to 5 years.

Magnitude of Healthcare Funds

The balances in the Healthcare Funds of OP&F, SERS and STRS are compared with the annual benefits and expenses paid from those funds in the table below.

Healthcare Funds and Annual Benefit Costs
($ amounts in millions)

	OP&F	SERS	STRS
Valuation Date:	January 1, 2003	July 1, 2002	July 1, 2002
Healthcare Fund:	$205.5	$335.2	$3,010.5
Annual Benefit Costs & Expenses:	155.9	183.9	434.3
Ratio:	1.3 years	1.8 years	6.9 years

Thus the Healthcare Funds of OP&F and SERS would be exhausted within 2 years if contributions ceased. The Healthcare Fund of STRS could continue to provide benefits for a number of years after contributions ceased.

Since Medicare Part B premium reimbursements are paid from the OP&F and STRS Healthcare Funds, all or a portion of those funds would need to be allocated to

mandated benefits before determining whether assets would remain to provide discretionary healthcare benefits.

IV. Estimated information as of July 1, 2003

The financial markets rebounded significantly between mid-March and June 30, 2003. Since that rebound improved the funded status of all of the systems, we roughly estimated its effect on the UALs and funding periods reported above. In this way, the ORSC can see a more up-to-date appraisal of each system's funded status. We based this estimate on the returns reported by the systems through June 30, 2003 for the ORSC semiannual investment report.

We have shown below calculations reflecting the estimated actuarial value of assets and the estimated market value of assets as of July 1, 2003. (Technically OP&F would not calculate its actuarial value of assets or funding period as of July 1 since it is the middle of its fiscal year.) We did so to reflect the favorable 2nd quarter of 2003 investment results in this report for all three systems.

Estimated Actuarial and Market Value of Pension Assets and Funding Period as of July 1, 2003

($ amounts in billions)

	OP&F	SERS	STRS
Estimated Actuarial Value:	$9.1	$8.6	$48.6
Estimated Market Value:	7.8	7.1	44.6
Difference in $:	1.3	1.5	4.0
Difference as % of MV:	17%	21%	9%
Est. Funding Period based on Actuarial Assets:	Infinite	55 years	59 years
Est. Funding Period based on Market Assets*:	Infinite*	Infinite*	Infinite*

* This would be the funding period if there were no "excess" returns over the next 4 or 5 years and the market value did not "catch-up" with the actuarial value of assets.

Thus the investment returns through June 30, 2003 have slightly narrowed the difference between the actuarial and market value of assets in OP&F since January 1, 2003 (the date of the most recent actuarial valuation), but not enough to reduce OP&F's funding period below infinity.

Investment returns for the entire 12 months since July 1, 2002 (the date of their most recent actuarial valuations) fell short of the long-term actuarial assumption in both SERS and STRS. Hence we estimate that each of their funding periods will increase as of July 1, 2003, unless other actuarial experience generated offsetting gains.

Roughly speaking, from July 1, 2003 forward the investment returns on the market value of assets in OP&F would have to exceed the actuarially assumed long-term average expected rate of return of 8.25% by $1.3 billion over the next 5 years ending July 1, 2008 in order for the market value to "catch-up" with the actuarial value of assets. This would require returns that average 11.7% over the next 5 years. Similarly, the investment returns in SERS and STRS would need to generate $1.5 and $4.0 billion of such excess returns for the market value to "catch-up" with the actuarial value of assets. To accomplish this objective over the same 5-year period, returns would need to average 12.5% and 9.6% for SERS and STRS, respectively, over that timeframe.

V. Projected funded status in 10 years if no changes made in contributions or benefits

Traditional actuarial calculations present single values for plan liabilities and costs even though there is significant uncertainty regarding future actuarial experience, e.g., variability in investment returns, inflation, retirement ages, etc.

Investment consultants deal with uncertainty regarding the economic factors that will affect the growth of plan assets and liabilities by making assumptions regarding expected investment returns and their volatility (as measured by standard deviation) and their interdependence (as measured by their correlation) in order to develop long-term investment strategies that reflect (a) the inherent uncertainty in future investment results and (b) the expected benefits of diversification in the types of investments to mitigate the impact of unfavorable deviations. They call these assumptions Capital Market Assumptions, which include the expected returns, standard deviations and correlation of investment returns for major classes of investments.

It is possible to use the same Capital Market Assumptions used by investment consultants to project the funded status of a retirement system so that, rather than showing only a single estimate of future results, the uncertainty regarding future results can be estimated by projecting the expected range of possible results.

It will be helpful to the ORSC to see the results of such an analysis for the following reasons.

- Only a few years ago, the benefits provided by OP&F, SERS and STRS were improved based, in part, on actuarial projections that indicated that the systems could afford to fund the cost of the improved benefits. Those actuarial projections were based on traditional actuarial projections, which reflect a single scenario where the future unfolds "as expected". Experience over the 3 years ending March 31, 2003 turned out to be extremely adverse.
- The Capital Market Assumption used by the investment consultants to OP&F, SERS and STRS all anticipate lower annualized (or compounded) investment returns over the next 10 years than the actuarial assumption regarding long-term average investment returns, which is used to prepare the actuarial valuations for the systems. (It is important to note that this apparent inconsistency is not a cause for concern ***if*** it is due to the expectation that investment returns and inflation over the next 10 years are lower than long-term –meaning the next 75 to 100 years –expectations. If investment returns were expected to be higher than the long-term average beyond the next 10 years, then blending the lower expected investment returns over the next 10 years with the higher later returns would justify such an assumption.)

- The ORSC needs information regarding the likelihood and magnitude of deviations in UALs and funding periods from the traditional actuarial projections due to expected volatility in future rates of investment returns and general wage inflation as it considers possible changes in the statutory contribution rates or benefits provisions.

A prime source of variation will be normal fluctuations that occur in the rate of investment returns and wage inflation. One way of estimating the range of possible outcomes is to stochastically model the financial operation of the systems using "Monte Carlo" techniques. (This is a generally accepted approach to estimate the range of possible outcomes.) This approach involves preparing 1,000 projections of financial results under randomly derived scenarios of investment returns and wage inflation. Each of these scenarios is based on statistical factors such as the expected annual return, the standard deviation of the annual return, and the correlation between the annual returns for different asset classes and inflation. The expected return on each asset class and the expected inflation component of wage growth were established by averaging the three sets of asset class expected returns and the inflation assumptions contained in the Capital Market Assumptions provided by the investment consultants to OP&F, SERS, and STRS. The standard deviation and correlation factors were developed by Milliman and were based on actual historical results over the period from 1970 to 2002 for representative market indices. In developing assumptions for the standard deviation of inflation and the correlation between inflation and asset class returns, we used the annual increases in the Social Security average annual wage index over this same time period. The assumptions are presented in Appendix A.

Those Capital Market Assumptions were applied to each system's asset mix based on its investment policy. By tabulating the results under all of these projections we estimated the probability that current assets, along with all anticipated employer and member contributions plus investment returns, will be sufficient to reduce the UALs and funding periods of OP&F, SERS and STRS.

In order to prepare forecasts of the range of UALs and funded periods in 10 years, we needed to make assumptions regarding the number of active members covered by the systems over the projection period and the age/gender/salary characteristics of future hires. We assumed that the number of active members will remain stable, i.e., not increase or decrease, over the 10 year projection period and that the age/gender/salary characteristics of new hires will mirror the age/gender/salary characteristics of active members as of the most recent valuation date with less than 1 year of service. (For STRS, using these new hire assumptions produces projected (a) declines in the members covered by the DB plan and (b) growth in the members in the Combined and DC plans over the next 10 years.)

We have summarized in the table below the results of this process. It illustrates the possible magnitude and variability of results by showing the UAL and funding period at various percentile levels. The 50th percentile represents the median result of these forecasts, that is one-half of the results are expected to be more favorable than this and

one-half are expected to be less favorable. The 5th percentile result is an extremely favorable result; that is, based on the assumptions there is only a 5% chance that a result this favorable or better will occur and a 95% chance that results will be less favorable. At the other extreme, the 95th percentile result is an extremely unfavorable result; that is, based on the assumptions there is only a 5% chance that a result this unfavorable or worse will occur and a 95% chance that results will be more favorable.

It is important to understand that these results are only illustrative of the range of results that are possible and are dependent on the assumptions utilized. (In addition to the assumptions described above, we assumed that there would be no actuarial gains or losses due to experience deviations from the other non-economic actuarial assumptions used by the systems.)

Projected Funded Status in 2014
assuming no changes in Contributions or Benefits
($ amounts in billions)

	OP&F	SERS	STRS
UAL/(Surplus):	**$**	**$**	**$**
Estimated as of July 1, 2003	1.8	1.9	17.3
5th percentile	(5.2)	(3.8)	(33.7)
10th percentile	(1.8)	(0.9)	(15.8)
15th percentile	0.2	0.8	(4.9)
20th percentile	1.2	2.1	4.0
25th percentile	2.3	2.9	9.4
50th percentile	6.0	6.6	33.9
75th percentile	9.4	9.9	53.3
95th percentile	13.1	13.3	73.7
Funding Period:	**in years**	**in years**	**in years**
Estimated as of July 1, 2003	Infinite	55	59
5th percentile	0	0	0
10th percentile	0	0	0
15th percentile	8	9	0
20th percentile	Infinite	37	7
25th percentile	Infinite	Infinite	18
50th percentile	Infinite	Infinite	Infinite
75th percentile	Infinite	Infinite	Infinite
95th percentile	Infinite	Infinite	Infinite

For example, there is a 25% chance that experience will be favorable and the UAL under STRS will decrease from $17.3 to $9.4 billion by June 30, 2014 and that its funding period at that time will be 18 years. This result is shown on the lines labeled as the ***25th*** percentile.

As another example, there is a 25% chance that experience will be quite unfavorable and the UAL under STRS will increase from $17.3 to $53.3 billion by June 30, 2014 and that its funding period at that time will be infinite. This result is shown on the lines labeled as the ***75th*** percentile.

Note that since we used each system's current actuarial assumptions and methods in preparing these projections, the projections treat OP&F's and STRS's Medicare Part B premium reimbursements as discretionary healthcare benefits, which is the approach taken by the actuaries for OP&F and STRS in preparing the annual actuarial valuations. As noted earlier, the SERS actuary treats these as mandated statutory benefits. As a result, the funded statuses of OP&F and STRS appear to be better relative to SERS than they would if all of the systems included the Medicare Part B Premium reimbursements in the UAL and funding period calculation for the benefits mandated by statute. We recommend that OP&F and STRS include these mandated Medicare Part B premium reimbursements in the calculation of their funding period in future actuarial valuations, as SERS does currently.

VI. Possible changes in Contribution Rates or Benefit Provisions needed to satisfy 30-year funding limit as of the beginning of the next fiscal year of the system

This section of the review will discuss several alternative options that could be adopted by the Boards or the Legislature in light of the decline in the financial markets since early 2000. We will first present information regarding possible modifications in contribution rates and then possible changes in benefit provisions to satisfy the 30-year funding limit. It would be possible to adopt more than one of the types of modifications illustrated. The possible changes will be presented in the following order:

A. Changes in Contribution Rates
   - Changes in the contribution rates allocated to discretionary healthcare benefits
   - Increases in employer contribution rates if the current healthcare allocations were frozen
   - Increases in member contribution rates if the current healthcare allocations were frozen
   - Additional time to bring funding period to 30-years

B. Possible benefit reductions to reduce the funding period

A. Changes in Contribution Rates

The current employer and member contribution rates to OP&F, SERS and STRS are summarized below along with the maximum statutory rates. The statutory contribution rates for OP&F were adopted by the Legislature in 1986. In 1983, the SERS Board raised the employer contribution rate to the maximum authorized by statute. The STRS Board raised its employer contribution rate to the statutory maximum rate in 1984.

	OP&F		SERS*	STRS	
	Police	**Fire**		**DB Plan**	**Combined Plan**
Current Contribution Rates:					
Employer Rate	19.50%	24.00%	14.00%	14.00%	14.00%
Member Rate	10.00	10.00	10.00	10.00	10.00
Total	29.50	34.00	24.00	24.00	24.00
Maximum Contribution Rates:					
Employer Rate	19.50%	24.00%	14.00%	14.00%	14.00%
Member Rate	10.00	10.00	10.00	10.00	10.00
Total	29.50	34.00	24.00	24.00	24.00

* SERS can assess an employer healthcare surcharge of up to an additional 1.5% to total system payroll in addition to the figures shown above to fund healthcare benefits. Also, since SERS has not yet established its DC plan, no information will be indicated in this or subsequent tables for anything other than the SERS DB plan.

Thus, all employers contribute to the retirement systems at the maximum rate allowed by statute and all members do likewise.

Appendix B contains a history of the contribution rates paid by employers and members taken from the ORSC Pension Profiles.

A(1). Changes in Contribution Rates allocated to Discretionary Healthcare Benefits

Under current law, the pension benefits and Medicare Part B reimbursements provided to retirees are established under Ohio law. The healthcare benefits provided by the systems are discretionary, in that the Boards are authorized to provide such benefits to the extent that they have the available financial resources to do so. Thus based on current law, the Boards should first allocate their available resources – that is, employer and member contributions – to provide pension benefits and Medicare Part B reimbursements. Allocations to provide discretionary healthcare benefits should be made only to the extent that additional contributions are available after fully providing for the statutorily mandated benefits.

We have summarized in the table below the maximum contribution rates set forth in statute and compared them with the estimated contribution rates required to be allocated to pension benefits and Medicare Part B reimbursements to comply with the 30-year funding period limit required by law as of the 2004 actuarial valuation.

Portion of Maximum Statutory Contribution Rates available for discretionary healthcare benefits after fully funding mandated Pensions and Medicare Part B reimbursements

	OP&F*			SERS**	STRS	
	Police	Fire	Combined		DB Plan	Combined Plan
Maximum Employer and Member Contribution Rates:						
Total	29.50%	34.00%	31.49%	24.00%	24.00%	24.00%
Actuarial cost of mandated benefits:						
Actuarial assets	30.10%	30.10%	30.10%	19.20%	26.10%	26.10%
Market assets	34.70%	34.70%	34.70%	23.00%	28.70%	28.70%
Contribution Rates available for discretionary benefits:						
Actuarial assets	(0.60%)	3.90%	1.39%	4.80%	(2.10%)	(2.10%)
Market assets	(5.20%)	(0.70%)	(3.21%)	1.00%	(4.70%)	(4.70%)
Current allocation to discretionary healthcare benefits:						
Allocation	7.75%	7.75%	7.75%	5.83%	1.00%	1.00%

* We have recommended in the past that the employer contribution rates for Police and Fire members should be equalized.

** SERS can assess an employer healthcare surcharge of up to an additional 1.5% to total system payroll in addition to the figures shown above to fund healthcare benefits.

An increase in contributions based on the actuarial value of assets figures would be consistent with the belief that there will be sufficient "excess" returns over the next few years for the market value of assets to "catch-up" to the actuarial value. An increase in contributions based on the market value of assets figures would be consistent with the belief that there would be no such "excess" returns.

As noted previously, only SERS includes in its actuarial calculations the actuarial cost of the Medicare Part B reimbursements. Thus Milliman has estimated the 30-year funding period cost figures for these Medicare Part B reimbursement benefits for OP&F and STRS. The assumptions used to estimate the cost of the Medicare Part B reimbursements are described in Appendix C. (We recommend that both OP&F and STRS include these mandated Medicare Part B reimbursement benefits in future actuarial valuations. This would be consistent with SERS current actuarial treatment of these benefits.)

If none of the systems earn "excess" returns and hence assets do not "catch-up" to the actuarial value of assets -

- SERS could comply with the 30-year funding period limit required by law by reducing its contributions allocated to discretionary healthcare benefits from 5.83% to 1.00%. That would necessitate a reduction in the discretionary healthcare benefits provided by SERS of roughly 65%, assuming that SERS continued to assess the employer healthcare surcharge.
- Neither OP&F nor STRS could comply with the 30-year limit required by law even if they eliminated all contributions allocated to discretionary healthcare benefits. If they eliminated such allocations, they would also have to eliminate discretionary healthcare benefits as soon as their current healthcare funds are exhausted.

If investments are assumed to earn "excess" returns and "catch-up" with the actuarial value of assets -

- OP&F and SERS could afford to allocate roughly 1.40% and 4.80% of the contribution rates, respectively, to discretionary healthcare benefits. Such an action would force a reduction in discretionary healthcare benefits of roughly 80% in the case of OP&F and 15% in the case of SERS, assuming that SERS continued to assess the employer healthcare surcharge.
- STRS will be unable to satisfy the 30-year funding period required by law as of June 30, 2004 even if all contributions were allocated to pension benefits and Medicare Part B reimbursements. If they eliminated such allocations, they would also have to eliminate discretionary healthcare benefits as soon as the current healthcare fund is exhausted.

If the contributions allocated to discretionary healthcare benefits were eliminated in any system, discretionary healthcare benefits would have to be eliminated or provided to retirees at full cost to the retiree.

A(2). Increases in employer contribution rates if the current healthcare allocations were frozen

We have estimated the magnitude of the contribution increases needed effective at the beginning of the next fiscal year in order to reduce the funding period of each system to 30 years assuming that the current contribution allocations to discretionary healthcare benefits were frozen at the levels indicated in the most recent actuarial valuation and have summarized those results below.

Since OP&F and STRS include the cost of the Medicare Part B reimbursements in their healthcare allocation, we have continued that practice in preparing this table, even though it understates the full actuarial cost of the mandated benefits. These estimates also assume that STRS would be able to increase the employer contributions from all employers currently contributing to STRS, including employer contributions attributable to members who participate in the STRS Defined Contribution Plan or an Alternative Retirement Plan, "ARP".

Employer Contribution Increase needed effective at the beginning of the next fiscal year to reduce Funding Period to 30 years as of the 2004 Actuarial Valuation

	OP&F	SERS	STRS		
			DB Plan	Combined Plan	DC Plan and ARP
Increase needed for 30-year funding period based on:					
Actuarial assets	4.10%	1.10%	3.00%	3.00%	3.00%
Market assets	8.70%	4.80%	5.60%	5.60%	5.60%

The contribution increases shown next to the Market assets were developed assuming that the market value of assets increased each year at the investment return assumption, which implies that "excess" returns will not be earned.

If no action is taken for five years to increase contributions or reduce benefits and there were no experience gains or losses during that period, the contribution increases necessary to achieve a 30-year funding period at that point –as of the 2009 actuarial valuations - will be somewhat higher than the figures shown above. Please note that "no experience gains or losses" implies that the actuarial assets increased each year at the actuarial investment return assumption, which implies that the before-mentioned "excess" returns were earned.

The magnitude of the estimated contribution increases needed at that point is summarized in the following table.

Employer Contribution Increase
effective the fiscal year beginning 2009
needed to reduce Funding Period to 30 years as of that date

	OP&F	SERS	STRS		
			DB Plan	Combined Plan	DC Plan and ARP
Increase needed for 30-year funding period based on:					
Actuarial assets	4.80%	1.20%	3.90%	3.90%	3.90%
Market assets	10.80%	6.10%	7.20%	7.20%	7.20%

A(3). Increases in member contribution rates if the current healthcare allocations were frozen

If member contribution rates were raised in order to reduce the funding period, they would need to be increased somewhat more than the increases in employer contribution rates shown above because a portion of member contributions is refunded to the member in the event the member elects to withdraw his contributions upon termination of employment. Thus only the portion of the member contributions expected to remain in the fund could be used toward funding the UAL. For OP&F, based on the current actuarial assumptions member contributions would need to increase roughly 1.10% to be equivalent to a 1.00% increase in employer contributions. The comparable figure for SERS is roughly 1.20%.

The comparable figure for STRS is difficult to estimate since changing member contribution rates may alter the selection pattern among new members between the DB Plan, the Combined Plan and the DC Plan. Assuming no such change in participant behavior, we estimate that the member contributions would need to increase roughly 1.40% to be equivalent to a 1.00% increase in employer contributions. However, if large additional member contribution requirements make the DB plan unattractive to new entrants, the member contributions might have to be increased even more to reflect the fact that fewer STRS members would join the DB plan. For example, if there were no new hires who joined the DB plan in the future, member contribution rates would need to increase roughly 2.50% to be equivalent to a 1.0% increase in employer contributions.

A(4). Increase employer contributions and grant additional time to bring funding period to 30-years

In light of the magnitude of the contribution increases necessary to offset the shortfall in investment returns over the past 3 years, consideration could be given to granting the systems additional time to reduce their funding periods to 30 years. To provide a rough indication of the extent to which contribution increases could be mitigated if additional time were granted to the systems to achieve the 30-year limit, we have summarized in the following table the contribution increases that would be required effective in 2004 in order to put the systems on track to achieve the 30-year limit in 10 years. (Or to put this differently, the contribution increase needed effective 2004 to produce a 40-year funding period as of the 2004 actuarial valuation date. If future experience were in line with the actuarial assumptions, the 40-year period would decrease to a 30-year period in 10 years.)

Employer Contribution Increase needed effective at the beginning of the next fiscal year to reduce Funding Period to 40 years

	OP&F	SERS	STRS		
			DB Plan	Combined Plan	DC Plan and ARP
Increase needed for 40-year funding period based on:					
Actuarial assets	3.30%	0.50%	1.50%	1.50%	1.50%
Market assets	7.30%	3.70%	3.60%	3.60%	3.60%

Merely granting an extra 10 years without a contribution increase would not enable any of the systems to comply with the 30-year limit by 2014.

B. Possible benefit reductions to reduce the funding period

To indicate the extent to which the cost of pension benefits and Medicare Part B reimbursements could be reduced by modifying the statutorily mandated benefits, we have roughly estimated the effect of rolling back several of the benefit improvements and increasing retirement eligibility requirements. These estimates were prepared solely to provide the ORSC a rough estimate of the benefit cutbacks that would be required to reduce the increases in employer and/or member contributions otherwise necessary to achieve a 30-year funding period immediately. (If the Legislature wishes to consider such benefit reductions, careful consideration of all of the benefit provisions of the systems should be undertaken to assure that the complete package of benefits provided by the systems interrelate logically. We have not undertaken such a comprehensive review in preparing this report.)

In developing these possible benefit reductions, we have assumed that the fully accrued benefit rights of members would not be reduced. Instead, only benefit amounts or entitlements which could be earned through future service by active members, or the passage of time in the case of retirees, would be affected.

Specifically, we considered the following package of possible changes for purposes of estimating the potential magnitude of savings to the systems if such reductions were made. Cost estimates could be prepared for many other packages if the ORSC or the Legislature wishes to consider benefit reductions.

- The automatic 3% cost-of-living adjustments to pensions enacted recently would be repealed and the prior cost-of-living provisions, which were based on the rate of inflation and limited to 3% in any year, would be reinstated.
- The rate of benefit accrual for active members in SERS and STRS would be reduced to 2% for each year of future service.
- The age and service requirements for unreduced retirement benefits in SERS and STRS would be increased by 2 years, with the exception that unreduced retirement would be permitted at age 67 with 5 years of service since that 5 year requirement seems more like a vesting provision than a retirement eligibility provision. Thus, active members not currently eligible for unreduced retirement at 30 years of service or at age 65 with 5 years of service would have to complete 32 years of service or attain age 67 with 5 years of service to become eligible for an unreduced retirement benefit.
- A similar 2-year increase in eligibility requirements would be made for reduced retirement benefits in both SERS and STRS.
- The age requirement for unreduced retirement in OP&F would be increased from age 48 for members with 25 years of service to age 52 with 25 years of service. Reduced pensions would be available at age 48 with 25 years of service for members who wish to retire before age 52. This would not apply to members who are currently age 48 or higher with 25 or more years of service.
- The Medicare Part B premium reimbursements in OP&F would be frozen at the $58.70 monthly premium rate in effect during 2003.

The resulting rough estimate of cost savings due to these changes if they were effective as of the 2004 actuarial valuations of the systems are summarized below.

Portion of Maximum Statutory Contribution Rates available after fully funding Pensions and Medicare Part B reimbursements if benefits were reduced based on the above package

	OP&F			SERS*	STRS	
	Police	Fire	Combined		DB Plan	Combined Plan
Maximum Employer and Member Contribution Rates:						
Total	29.50%	34.00%	31.49%	24.00%	24.00%	24.00%
Actuarial cost of mandated benefits:						
Actuarial assets	24.90%	24.90%	24.90%	15.30%	21.30%	21.30%
Market assets	29.50%	29.50%	29.50%	19.10%	23.80%	23.80%
Contribution Rates available for discretionary benefits:						
Actuarial assets	4.60%	9.10%	6.59%	8.70%	2.70%	2.70%
Market assets	0.00%	4.50%	1.99%	4.90%	0.20%	0.20%
Current allocation to healthcare benefits:						
Allocation	7.75%	7.75%	7.75%	5.83%	1.00%	1.00%

* SERS can assess an employer healthcare surcharge of up to an additional 1.5% to total system payroll in addition to the figures shown above to fund healthcare benefits.

This preliminary analysis indicates that it may be possible to develop a package of benefit reductions along the lines summarized above that would enable both SERS and STRS to comply with the 30-year funding period limit required by law while continuing to allocate a portion of the contributions to discretionary healthcare benefits. In the case of OP&F, the benefit reductions described above would allow OP&F to comply with the 30-year limit if they reduced the contributions to discretionary healthcare benefits from 7.75% to either 6.59% or 1.99% of payroll, depending on whether "excess" returns develop over the near term. These figures would require a reduction in the discretionary healthcare benefits of roughly 15% and 75%, respectively.

The current benefit provisions and possible benefit reductions are summarized in Appendix D and the modifications to the actuarial assumptions and methods made to prepare these rough estimates are summarized in Appendix E.

APPENDIX A
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Capital Market Assumptions and Asset Allocations used in the actuarial projections*

Expected:	Inflation Component of Wage Growth	US/Priv Equities	International/ Emerging Mkt Equities	Fixed Income	High Yield	Real Estate	Cash
Annual Return (Arithmetic)	2.50%	9.10%	9.00%	5.40%	7.65%	8.10%	3.80%
10-Year Annualized Return	2.48%	7.82%	6.95%	5.18%	6.99%	6.96%	3.77%
Standard Deviation	2.10%	17.75%	22.60%	7.20%	12.60%	16.70%	2.70%
Asset Allocation:							
OP&F	n/a	49.00%	20.00%	18.00%	5.00%	8.00%	--
STRS	n/a	47.00%	20.00%	23.00%	--	9.00%	1.00%
SERS	n/a	49.00%	16.00%	23.00%	--	10.00%	2.00%
Correlation:							
Inflation p/o Wage growth	1.00	0.09	0.23	-0.32	-0.17	0.08	0.26
US/Priv Equity		1.00	0.57	0.32	0.59	0.52	0.09
Intern/Emerg Equity			1.00	0.05	0.35	0.23	-0.04
Fixed Income				1.00	0.64	0.32	0.15
High Yield					1.00	0.59	0.04
Real Estate						1.00	0.07
Cash							1.00

* Expected returns were set equal to the average of the expected returns provided by OP&F, STRS, and SERS.

Standard deviations and correlation estimated by Milliman using historical return data from 1970 through 2002 from representative indices.

The inflation component of wage growth based on the annual increases in the Social Security average annual wage index.
A blended return assumption was developed for US and Private Equity.
A blended return assumption was developed for International and Emerging Market Equity.

Capital Market Assumptions provided by SERS
10-Year Average from 1/1/2003

Expected:	US Equity	Non-US Equity	Aggregate Fixed Income	Intermediate Fixed Income	Long Bonds	Inflation	Public Real Estate	Private Real Estate	Private Equity
10-Year Annualized Return	7.50%	7.50%	5.30%	4.50%	4.80%	2.40%	6.30%	8.30%	12.50%
Arithmetic Mean - Estimated by Milliman	8.83%	8.97%	5.33%	4.54%	4.86%	2.41%	7.23%	8.78%	18.36%
Annual Standard Deviation	18.10%	19.10%	2.80%	3.00%	3.60%	3.70%	15.00%	10.80%	40.90%
Correlation:									
US Equity	1.00	0.56	0.25	0.20	0.08	0.10	0.34	0.04	0.32
Non-US Equity		1.00	0.21	0.18	0.09	0.13	0.29	0.00	0.19
Agg Fixed Income			1.00	0.90	0.76	0.50	0.38	-0.12	0.08
Interm Fixed Income				1.00	0.61	0.68	0.42	-0.15	0.07
Long Bonds					1.00	0.18	0.10	-0.15	0.01
Inflation						1.00	0.33	-0.05	0.05
Public Real Estate							1.00	0.12	0.13
Private Real Estate								1.00	0.05
Private Equity									1.00

Capital Market Assumptions provided by STRS

Expected:	Domestic Equities	International Equities	Fixed Income	Real Estate	Alternative Investments	Liquidity Reserves	Inflation
Annual Return (Arithmetic)	8.40%	8.40%	6.00%	7.80%	13.40%	4.30%	2.75%
10-Year Annualized Return - Estimated by Milliman	7.08%	6.78%	5.79%	7.10%			2.73%
Annual Standard Deviation	18.00%	20.00%	7.00%	13.00%	NP	NP	2.00%
<u>Correlation:</u>							
Domestic Equity	1.00	0.60	0.35	0.30	NP	NP	NP
International Equity		1.00	0.25	0.15	NP	NP	NP
Fixed Income			1.00	0.15	NP	NP	NP
Real Estate				1.00	NP	NP	NP
Alternative Investments					1.00	NP	NP
Liquidity Reserves						1.00	NP
Inflation							1.00

"NP" means the assumption was not provided

Capital Market Assumptions provided by OP&F
2003 Asset Allocation Return and Risk Assumptions

Expected:	US Stocks	Non-US Stocks	US Bonds Lehman Aggregate	High Yield Debt	Reits/ Real Estate	Emerging Markets	Private Markets Portfolio	Cash	Inflation
10-Year Annualized Return	8.00%	8.00%	4.75%	7.00%	6.75%	8.00%	11.00%	3.00%	2.25%
Arithmetic Mean - Estimated by Milliman	9.17%	9.60%	4.86%	7.67%	7.80%	10.84%	14.37%	3.25%	2.26%
Annual Standard Deviation	17.00%	20.00%	5.00%	10.00%	16.00%	27.00%	30.00%	1.00%	1.30%
Correlation:									
US Stocks	1.00	0.65	0.30	0.50	0.45	0.60	0.77	0.00	NP
Non-US Stocks		1.00	0.20	0.30	0.35	0.75	0.52	-0.10	NP
Lehman Aggregate			1.00	0.40	0.30	0.10	0.29	0.10	NP
High Yield				1.00	0.50	0.20	0.35	-0.10	NP
Reits/RE					1.00	0.20	0.42	0.00	NP
Emerging Markets						1.00	0.10	0.00	NP
Private Markets							1.00	0.00	NP
Cash								1.00	NP
Inflation									1.00

Assumption for other asset classes were provided; Milliman selected these based on OP&F's current investment policy

"NP" means the assumption was not provided

Appendix B

CHANGES IN EMPLOYER CONTRIBUTION RATES (AS PERCENT OF PAYROLL)

NON-UNIFORMED EMPLOYEE SYSTEMS

YEAR CHANGE OCCURRED	PERS STATE	PERS NON-STATE	STRS	SERS
1920			5.57	
1923			4.70	
1924			3.70	
1926			3.60	
1927			3.57	
1930			3.45	
1935	4.80			
1937				5.57
1938			3.82	
1939		4.80	4.44	5.50
1941			4.00	
1942		4.30		5.00
1943	4.30			
1945			5.00	5.50
1946		5.40	4.75	
1947	5.40		5.75	6.50
1948		5.70	7.50	7.00
1949	6.05		7.25	
1950		5.90		
1951	6.95		8.50	8.00
1952		7.00	8.00	7.75
1953	7.10			7.50
1955			9.25	8.00
1956		7.25		

YEAR CHANGE OCCURRED	PERS STATE	PERS NON-STATE	STRS	SERS
1957	7.35			
1958			9.33	
1959	7.41	7.31	10.41	
1960		8.51		9.22
1961	8.61			
1963	7.91	7.27		
1964		7.37	11.00	
1965	8.03		11.27	10.00
1966	9.00		11.50	
1967		8.00		
1969	10.00	9.00	12.90	11.40
1973	10.40	9.40		
1974			12.55	12.50
1975	12.00	11.20		
1976		11.90		
1977	13.71	13.95	13.50	
1983				14.00*
1984			14.00	
1991	13.31	13.55		
2000**				

*In addition to the 14% employer contribution rate, the SERS board was authorized by H.B. 290 effective 9/9/88 to impose an employer surcharge on the salaries of members earning below a minimum compensation amount in order to fund health care benefits. S.B. 270 (eff. 4/9/01) limited the maximum employer surcharge amount to no more than 2% of an individual employer's payroll for employees covered under SERS and limited the aggregate amount collected through the employer surcharge to no more than 1.5% of the total SERS active member payroll.

**In 2000, the PERS board adopted a temporary employer contribution rate rollback for July 2000 through December 2000. The PERS State rollback rate was 7.99% for that period; the PERS Non-State rollback rate was 8.13% for that period.

CHANGES IN EMPLOYER CONTRIBUTION RATES
(AS PERCENT OF PAYROLL)

UNIFORMED EMPLOYEE SYSTEMS

YEAR CHANGE OCCURRED	OP&F POLICE	OP&F FIRE	HPRS	PERS-LE
1941			4.00	
1950			5.00	
1966			9.00	
1967	13.55	13.13		
1968	13.66	13.50		
1969	14.68	14.48		
1970	15.52	15.52		
1971	12.81	12.96	10.00	
1972	12.96	13.26		
1973	12.85	13.41		
1974	12.88	13.60		
1975	12.49	13.78	13.00	18.10
1976	14.02	15.57		
1977	15.34	16.77	13.25	
1978	17.53	18.90		
1979	18.40	20.11	18.00	
1980	15.70	19.87		
1981	15.60	20.72	22.00	
1982	16.62	22.39		
1983	18.45	23.57	24.80	
1985	20.03	24.59	24.66	
1986	19.50	24.00		
1989			24.39	
1991			24.53	16.00
1994				16.70
1996			24.00	
1999			23.50	
2000*				
2003			24.50	

*In 2000, the PERS board adopted a temporary employer contribution rate rollback for July 2000 through December 2000. The PERS-LE rollback rate was 14.70% for that period.

Appendix C

Medicare Part B Premium Reimbursements

Actuarial Assumptions

Rate of Increase in future premiums: We assumed that Part B premiums would increase at the annual rate of 8% per year. The actual rate of increase over the past 20 years was 7.9%. This was only used for OP&F since the Medicare Part B premium reimbursements are frozen for SERS and STRS.

For STRS, we assumed that 60% of members retiring with an annuity elect a joint and survivor annuity. Thus their surviving spouse would be eligible for the Medicare Part B reimbursement after the death of the retired member. We also assumed that 25% of members terminating prior to retirement eligibility would elect a lump sum payment in lieu of an annuity benefit at retirement.

Appendix D

Comparison of Current Plan Provisions and Reduced Provisions

SERS and STRS

Provision	Ohio State Teachers Current Plan	Ohio School Employees Current Plan	Proposed Plan
Eligibility for Normal Retirement with Unreduced Benefit	Age 65 with 5 years of service, or 30 years of service with no age requirement	Age 65 with 5 years of service, or 30 years of service with no age requirement	No change if currently eligible; otherwise age 67 with 5 years of service, or 32 years of service with no age requirement
Normal Retirement Benefit	2.2% accrual for 1st 30 years; rate of accrual increases from 2.5% at 31 years of service by 0.1% for each additional year beyond 30; on completion of 35 years of service, accrual rate is 2.5% for the first 30 years of "contributing" service	2.2% accrual for 1st 30 years, 2.5% accrual for each year after 30 years	Prior accrual rates for all past service; 2.0% accrual for all future years
Eligibility for Early Retirement with Reduced Benefit	Age 55 with 25 years of service, or Age 60 with 5 years of service	Age 55 with 25 years of service, or Age 60 with 5 years of service	No change if currently eligible; otherwise age 57 with 27 years of service, or Age 62 with 5 years of service
Early Retirement Benefit	Reduced by an age and service related reduction factor. The reduction factor is based on years earlier than age 65 or 30 years of service	Reduced by an age and service related reduction factor. The reduction factor is based on years earlier than age 65 or 30 years of service	Reduced by an age and service related reduction factor. The reduction factor is based on years earlier than age 67 or 32 years of service

Provision	Ohio State Teachers Current Plan	Ohio School Employees Current Plan	Proposed Plan
Disability Allowance Continuation	For disability “allowance” members – disability benefit reverts to service retirement benefit at age 65 (or later if disability occurs after age 60)	For disability “allowance” members – disability benefit reverts to service retirement benefit at age 65 (or later if disability occurs after age 60)	For disability “allowance” members – disability benefit reverts to service retirement benefit at age 67 (or later if disability occurs after age 64) (This change does not shorten the period participants who are disabled after age 60 receive a disability allowance.)
Disability Allowance	2.2% accrual for each year of service; minimum of 45% of average pay, maximum of 60% of average pay	2.2% accrual for each year of service; minimum of 45% of average pay, maximum of 60% of average pay	2.0% accrual for each year of service; minimum of 45% of average pay, maximum of 60% of average pay
Cost of Living Adjustments	Fixed 3.0% of base benefit each year	Fixed 3.0% of base benefit each year	The lesser of actual CPI-W increase during year and 3.0%. Increases in the CPI-W greater than 3% would be credited to COLA accounts. The COLA accounts would be used to increase the actual COLA to up to 3.0% if the CPI-W increase in future years is less than 3.0%. Prior COLA accounts reinstated and updated.

Ohio Police & Fire

Provision	Current Plan	Proposed Plan
Eligibility for Normal Retirement and DROP	Age 48 with 25 years of service or age 62 with 15 years of service	Age 52 with 25 years of service or age 62 with 15 years of service
Eligibility for Early Retirement	Not available	Age 48 with 25 years of service
Early Retirement Benefit	Not available	Same benefit as for Normal Retirement, reduced for early commencement. (75% @ 48; 80% @ 49; 86% @ 50; 93% @ 51)
Termination prior to Retirement after 15 years of service – Commencement of accrued benefit	The later of age 48 and the 25th anniversary of full-time hire date	The later of age 52 and the 25th anniversary of full-time hire date
Medicare Part B premium reimbursement	100% of actual premium during year	$58.70 per month
Cost of Living Adjustments	Fixed 3.0% each year	The lesser of actual CPI-W increase during year and 3.0%. Increases in the CPI-W greater than 3% would be credited to COLA accounts. The COLA accounts would be used to increase the actual COLA to up to 3.0% if the CPI-W increase in future years is less than 3.0%. Prior COLA accounts reinstated and updated.

Appendix E

Actuarial Assumptions and Methods for Benefit Reductions

OP&F

Actuarial Assumptions

Retirement Rates: No change in the rates of normal retirement, except that for members not yet 48 with 25 years of service (a) the rates prior to age 52 were eliminated and (b) the rate at age 52 was increased to 30% (the current rate at age 48, 1st eligibility, is 30%). Early retirement rates were estimated to be 5% per year. (This was the early retirement rate from the January 1988 valuation when this early retirement provision was in effect.)

Future COLAs: Based on the assumption of 3% increases in the rate of increase in the CPI-W, COLAs were assumed to average 2.6% per year. Retired members since July 1, 1988 were assumed to have exhausted their COLA accounts. Members who retired earlier were assumed to have COLA accounts adequate to increase the COLA adjustment to 3% in each future year of retirement.

Actuarial Cost Method

The Entry Age Normal Cost was developed assuming that all employees were covered by the new reduced benefits from their date of hire. Thus the Entry Age Normal Cost should be relatively stable over time. The Present Value of Benefits was developed reflecting the transition provisions (i.e., the historical benefit accrual rates applicable to past service and the protection of normal or early retirement eligibility for those already eligible). Thus the Actuarial Accrued Liability includes all liabilities associated with the transition provisions.

SERS and STRS

Actuarial Assumptions

Retirement Rates: No change in the rates of retirement, except to increase by 2 years the eligibility criteria.

Future COLAs: Based on the assumption of 3% increases in the rate of increase in the CPI-W, COLAs were assumed to average 2.6% per year. Retired members since July 1, 1988 were assumed to have exhausted their COLA accounts. Members who retired earlier were assumed to have COLA accounts adequate to increase the COLA adjustment to 3% in each future year of retirement.

Actuarial Cost Method

The Entry Age Normal Cost was developed assuming that all employees were covered by the new reduced benefits from their date of hire. Thus the Entry Age Normal Cost should be relatively stable over time. The Present Value of Benefits was developed reflecting the transition provisions (i.e., the higher benefit accrual rates applicable to past service and the protection of normal or early retirement eligibility for those already eligible). Thus the Actuarial Accrued Liability includes all liabilities associated with the transition provisions.